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AMERICAN Gas Journal

THE MAGAZINE OF GAS DISTRIBUTION

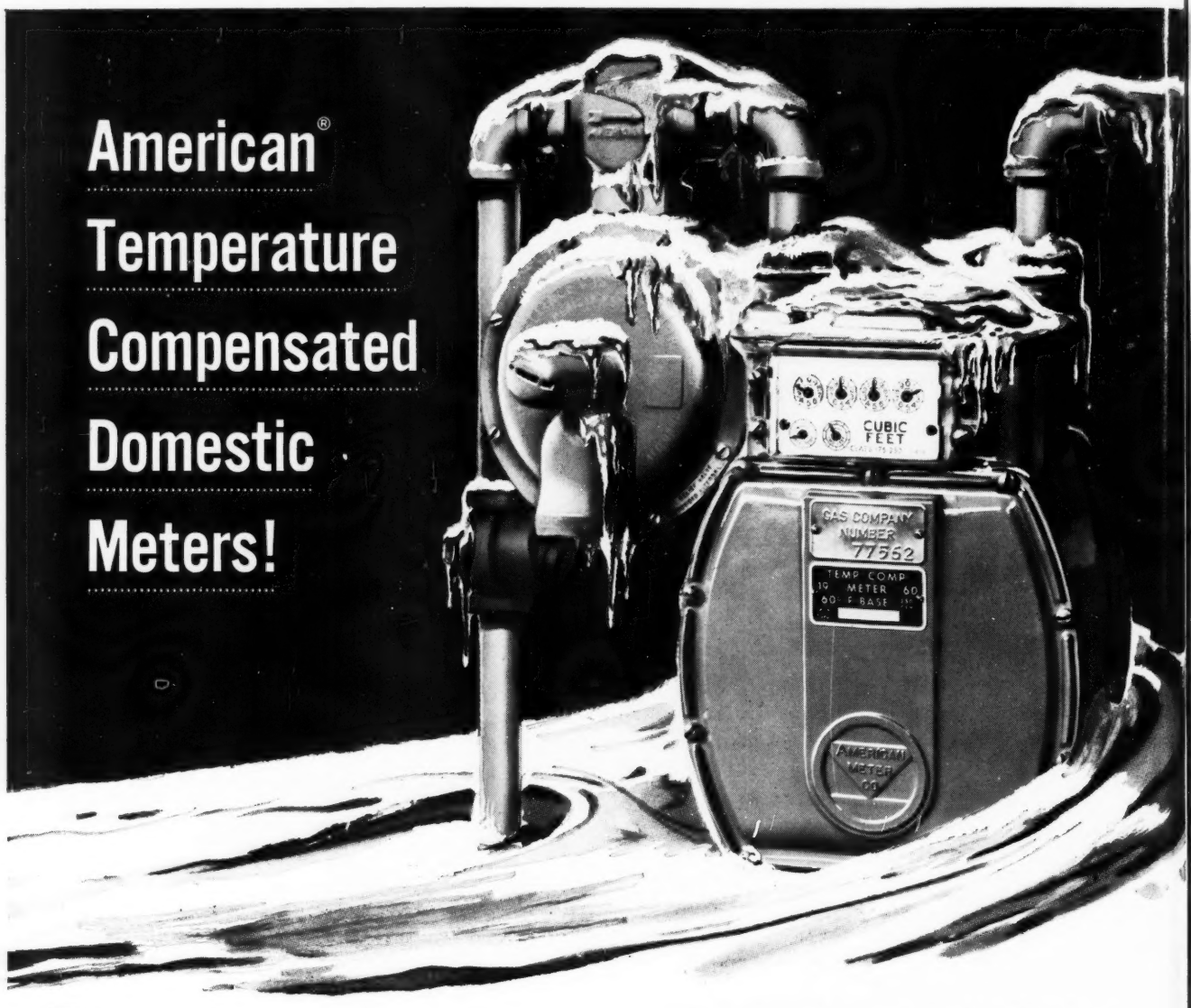
Standardized Truck Loading

Beginning math series: Lay That Slide Rule Down

Quick Change Orifice Cap

JANUARY 1961

Now, from the pioneers in temperature compensation...



Once again, American Meter Company research has made a tremendous contribution to the technological progress of the entire Gas Industry. Like every other American Meter advance, the Temperature Compensating Domestic Meters are an outgrowth of the Company's continuous search for *better* ways to serve the industry's needs. In fact, nearly 30 years have passed since American Meter introduced the first temperature compensating device for large Positive Displacement Meters — the Base Volume Index.

The new Temperature Compensator is continuing proof that the Gas Industry can count on American to develop the most modern, accurate measurement equipment. American has pioneered in meter progress since 1836 — and will continue to bring progress through research!

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PILOT LIGHTS

Throw That Whatsit Away!

Good housekeeping means more than sweeping the dirt under the rug . . . and good housekeeping applied to service trucks used in the gas distribution industry means having a place for everything . . . and everything in its place. At Southern Counties Gas Company, introduction of a standardized truck loading program has increased operating efficiency, makes it possible for a fieldman to work with any truck to which he might be assigned, and keeps the amount of material carried on trucks within a reasonable limit.

First step in accomplishing such a program was to strip all trucks of all supplies (and miscellaneous items). The "truck stripping" produced many unusual — and humorous — items . . . as portrayed by "Sam Serviceman" above with his "whatsit." Details on the other steps . . . and how the program was implemented . . . are found beginning on page 18.

Squares Can Be Fun!

Don't throw away your slide rule . . . but you can put it aside and use some quick, convenient short cuts in your calculations after reviewing Professor Paul Grogan's interesting and informative series on applied, simplified mathematics for engineers and operating men. Part 1 in this issue (page 26) explains corner-cutting with squares.

Next Month

. . . An improved method of mapping for making complete, accurate maps of gas distribution systems in rough-terrained territories.

American Gas Journal
THE MAGAZINE OF GAS DISTRIBUTION

VOLUME 188 **JANUARY 1961** NUMBER 1

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Southern Counties Gas Company's standardized service truck loading technique improves efficiency, makes it easier for fieldman to work with any truck to which he is assigned.

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Lightly flavored with humor, new math series is aimed to help the engineer who wants to refresh his mathematics training and grease the gears between the ears.

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New device, developed by Mountain Fuel Supply Co., helps speed testing of large meters . . . test can be completed in time formerly needed to make initial hookup of meters for testing.

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of soapy water
tells you all
you need to
know

It's easy to test the tightness of your pipe joints when you make connections with Dresser Couplings and Fittings. All you do is "paint" the joint with soapy water and check for bubbles. That's all. No X-Rays, no elaborate equipment, no multi-step inspection process. Controlled quality standards maintained under ideal factory conditions pre-assure soundness, eliminate porosity, other possible joint defects. Thus the soap test merely confirms proper installation. Make soapy water your inexpensive test device — specify Dresser with confidence.

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M C F

NEWS HILITES OF THE INDUSTRY

First official step in bringing vast supplies of gas to Southern California to be used for generating electricity has been taken. California Gas Transmission Company, a subsidiary of Tennessee Gas Transmission Company, has filed application with the California PUC for permission to build the California segment of the line. The entire project—a $225,000,000 line 1600 miles long—would run from Texas Gulf Coast fields across northern Mexico into California to generating plants of Southern California Edison Company. Robert P. O'Brien, Edison vice president, said the proposal would allow *"local gas companies to make available to other industry the gas they (now sell) to us."* He suggested that gas might also be "made available" to local gas companies during peak gas demand periods. Target date for first deliveries of gas was set for July 1, 1962. *Subsequently, (Dec. 23) two subsidiaries of TGT filed companion applications with the FPC seeking presidential permit to build and operate facilities for export of natural gas from Texas to Mexico and a similar permit to import the gas back through the California-Mexico border.*

New job for gas-fired infra-red heaters is keeping commuters warm at Jamaica, Long Island, New York. Eight gas-fired radiant heating units are being installed over a 30-ft section of the Long Island Rail Road Company's windswept platform at Jamaica, one of the world's busiest commuter railway stations. Living room comfort isn't expected, say railroad officials, but if the heating system seems worthwhile, it will be extended to other stations.

Call him "Representative Stephens" now. Arkla Gas board chairman W. R. Stephens is now a member of the Arkansas House of Representatives, having been elected in a landslide write-in vote in his native Grant County, Arkansas. He will be one of 100 members of the state legislative body when it convenes in January, along with the state's 35-member Senate. Stephens was elected after being suggested as a write-in candidate by the incumbent candidate who would have been prevented from serving due to illness.

Richfield Oil Corporation is not a public utility, the U. S. Supreme Court has indirectly decided by refusing to review objections by Southern Counties Gas Company of California to a state (California) supreme court ruling. Richfield sells gas to Southern California Edison Company and in 1959 built a 58-mile gas transmission line to supply Edison's Mandalay steam plant in Ventura. Southern Counties objected and the California PUC held Richfield was a public utility and needed a commission certificate to build and operate the line. California's supreme court ruled otherwise.

How unconstitutional is Texas' "severance beneficiary" tax? The Texas state attorney general's office plans to find out. It has asked the state's Third Court of Civil Appeals to uphold the tax on natural gas, appealing a lower court decision that the tax is unconstitutional. Assistant state attorney general C. K. Richards contended that it is valid for a state to tax "manufacturing, production, or severance" of a product even though it is "destined for transportation in interstate commerce." Attorneys for six companies in a test case attacking the tax said the tax is "far more repugnant to the constitution than was the gas gathering tax *(of 1953, ruled out by the U. S. Supreme Court in 1954)."*

Industrial gas supply system operated in the area of the Houston (Texas) ship channel by Pan American Gas Company will be expanded by some 50 miles of line. Expansion program is part of Pan American's program to seek new industrial gas markets in various important industrial centers in the central and southwestern United States. Gas delivered and sold by the system moves only in intrastate commerce.

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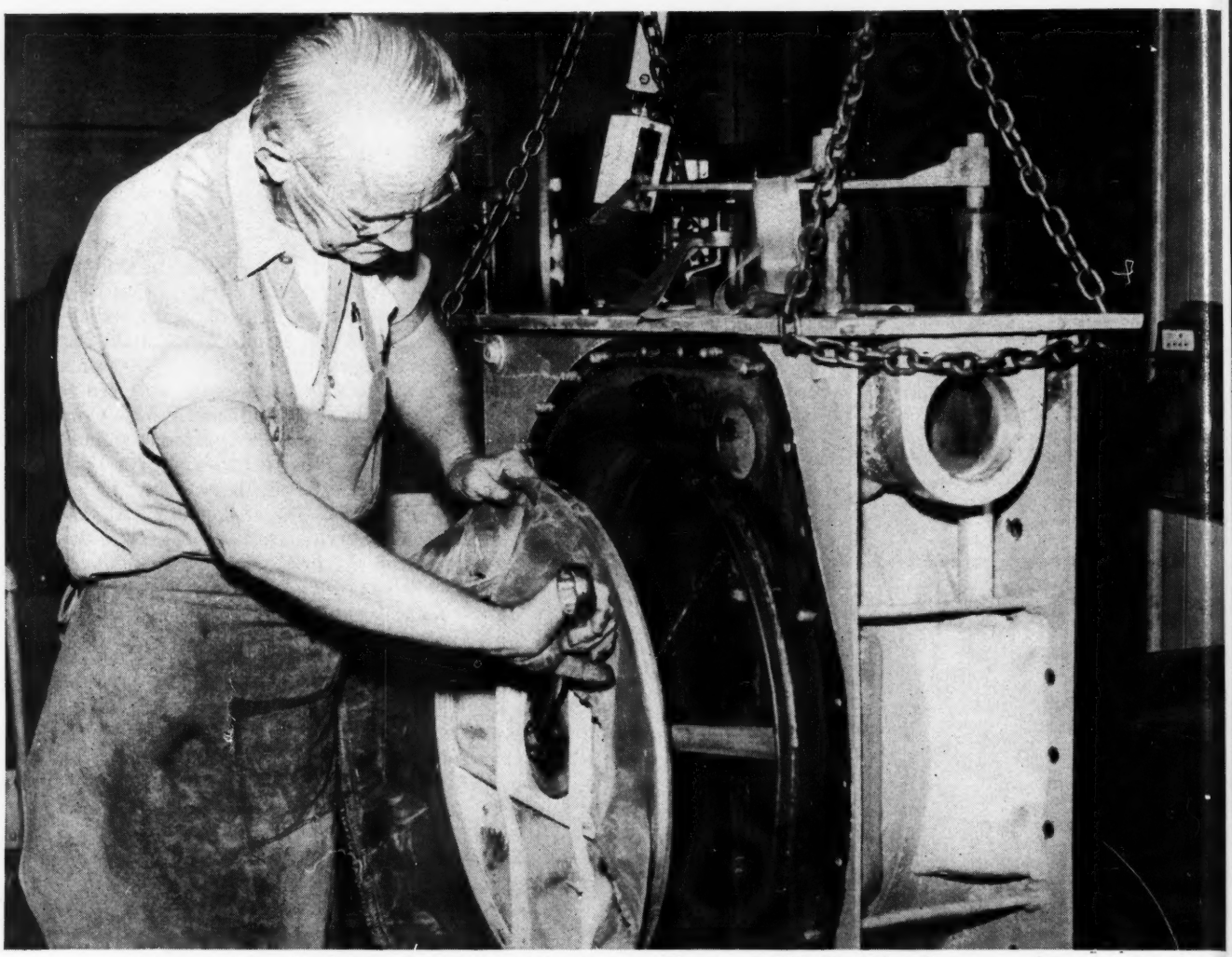

In large volume displacement meters—and in all types of meters—Ohio Fuel Gas Company relies on Reeves-Vulcan synthetic diaphragms for greater dependence, longer life and lower maintenance costs.

"We greatly reduced P.D. meter maintenance with Reeves-Vulcan synthetic diaphragms"

M. P. DeBaets, General Superintendent Gas-Measurement Department, Ohio Fuel Gas Company, Columbus, Ohio

"The frequent replacement of leather diaphragms required in large-volume, positive-displacement meters on gas wells," says Mr. DeBaets of Ohio Fuel Gas, "was, at one time, one of our major maintenance problems."

Problem: "When we were using leather diaphragms, the impurities in the wellhead gas would wash the oil out of the diaphragms, and diaphragms had to be replaced frequently. And cold weather aggravated the situation."

Solution: "About 6 years ago, we changed to Reeves-Vulcan synthetic diaphragms for these meters, as well as for industrial and domestic meters. Our experience shows that Reeves-Vulcan synthetic diaphragms last longer... withstand wellhead gas impurities...operate better at low temperatures... are not affected by odorants. What's more, since they require no oil, maintenance schedules have been extended."

Since changing to Reeves-Vulcan synthetic diaphragms, Ohio Fuel Gas reports substantial savings through reduction in meter maintenance and testings, and a much lower rate of diaphragm replacement. How about *your* metering efficiency?

There's a Reeves-Vulcan diaphragm for practically every type of gas meter made. Both molded and crimped styles are available in any volume. Order Reeves-Vulcan synthetic diaphragms from leading manufacturers or directly from:

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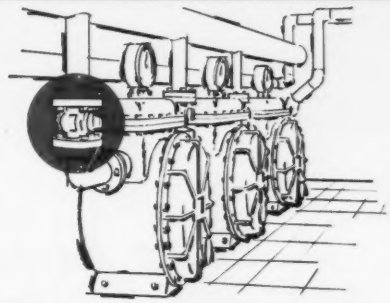
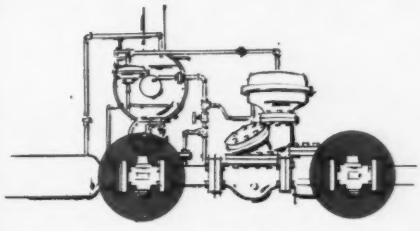
To fill more of your specific needs, here is a brand-new pattern of LubOseal Stop. This flanged end stop should find a great many applications throughout your distribution system—particularly in commercial installations.

Introduced in 1952 to meet the demands of higher gas distribution pressures, the Mueller LubOseal Meter Stop gained immediate and widespread acceptance. From two basic patterns has come a full line of reliable stops. Recessed end LubOseals were added in 1958. The need for extremely high pressure meter stops led to production of 500 Pound-Ductile Iron LubOseal Stops in 1959. Customer requests for a dependable meter stop with an insulating outlet resulted in the introduction of the Insulating Union LubOseal in 1960.



FOR LARGE METER INSTALLATIONS



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Calendar
OF COMING EVENTS

January, 1961

17 NEGA operating division, Monticello Restaurant, Framingham, Mass.
17-19 Instrument Society of America winter instrument-automation conference and exhibit, Sheraton-Jefferson Hotel, St. Louis, Missouri.

February

3 NEGA-C-H-I division, Sheraton Biltmore Hotel, Providence, Rhode Island.
15 NEGA street department supervisors group, Hotel Bancroft, Worcester, Massachusetts.
23-24 A.G.A.-PCGA-C.G.A. joint public relations conference, Benson Hotel, Portland, Oregon.

March

2- 3 SGA transmission management, Sheraton-Dallas, Dallas, Texas.
13-17 National Association of Corrosion Engineers, annual conference, Hotel Statler, Buffalo, New York.
16-17 SGA distribution management, Dinkler Plaza Hotel, Atlanta, Georgia.
16-17 NEGA annual meeting, Statler Hilton Hotel, Boston, Massachusetts.
16-17 Oklahoma Utilities Association, annual meeting, Tulsa Hotel, Tulsa, Oklahoma.
27-28 Mid-West Gas Association annual meeting and convention, Sheraton-Fontenelle Hotel, Omaha, Nebraska.

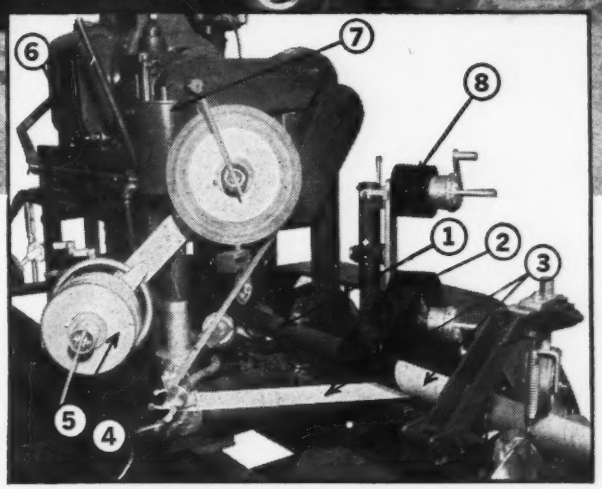
April

4- 6 A.G.A. research and utilization conference, Sheraton Cleveland Hotel, Cleveland, Ohio.
6- 7 PCGA distribution conference, Biltmore Hotel, Los Angeles, California.
9-13 ASME Oil & Gas Power conference and exhibit, Jung Hotel, New Orleans, Louisiana.
10-21 American Welding Society, International Institute of Welding, annual convention and welding exposition, Sheraton-Atlantic, New York, New York.
11-13 A.G.A. sales conference on industrial and commercial gas, Prince Edward Hotel, Windsor, Ontario, Canada.
13-15 GAMA annual meeting, Boca Raton, Florida.
16-19 A.G.A.-EEI national conference of electric & gas utility accountants, The Chase-Park Plaza Hotels, St. Louis, Missouri.
17-18 PCGA commercial-industrial sales conference, Los Angeles area.
18-20 Southwestern Gas Measurement Short Course, University of Oklahoma, North Campus, Norman, Oklahoma.
24-26 Southern Gas Association, annual convention, Roosevelt and Jung hotels, New Orleans, Louisiana.
30-May 2 Independent Petroleum Association of America, midyear meeting, Roosevelt Hotel, New Orleans, Louisiana.

May

8-12 PCGA commercial gas sales school, Villa Hotel, San Mateo, California.
8-12 A.G.A. operating section distribution and production conference, Sheraton Hotel, Philadelphia, Pennsylvania.
14-18 National Fire Protection Association annual meeting, Detroit, Michigan.

NEW TECHNIQUE ASSURES PERFECT ON-SITE COATING



Pipe (coming toward you) spins through machine . . . undergoes dynamic cleaning from twin-powered brush heads. Coating comes off brake-type tape drum. Outer wrapping runs through fast-gluing adhesive attachment.

1. Spinning pipe
2. Polyken tape coating
3. Outer wrap
4. Glue applicator
5. Stand-by outer wrap turret
6. Power brush heads
7. Glue tank
8. Stand-by tape turret

POLYKEN QUALITY PLUS UNIQUE APPLICATION METHOD MAKE TOP SITE-WRAP COMBINATION

Your protective coating results are only as good as the material you use and the way you put it on. And with Polyken tape . . . plus the special, new Polyken way of on-site application . . . you get a combination that really does a perfect job —*simply, speedily, economically.*

Simplicity? Right! The completely mobile machine sets up in an hour (knocks down in half that time), uses 6 men or less for continuous cleaning, coating, and wrapping. Speed? You can process up to 20,000 lineal feet a day, take 10-minute breaks to switch pipe sizes. Economy? Look at it this way: You get *quality* tape, properly applied by a high-speed *quality* process. The result can't help meaning more *dependable* coating for your dollar.

For the full story on both machine and tape, see your Polyken representative. It can mean maximum protection at minimum investment.

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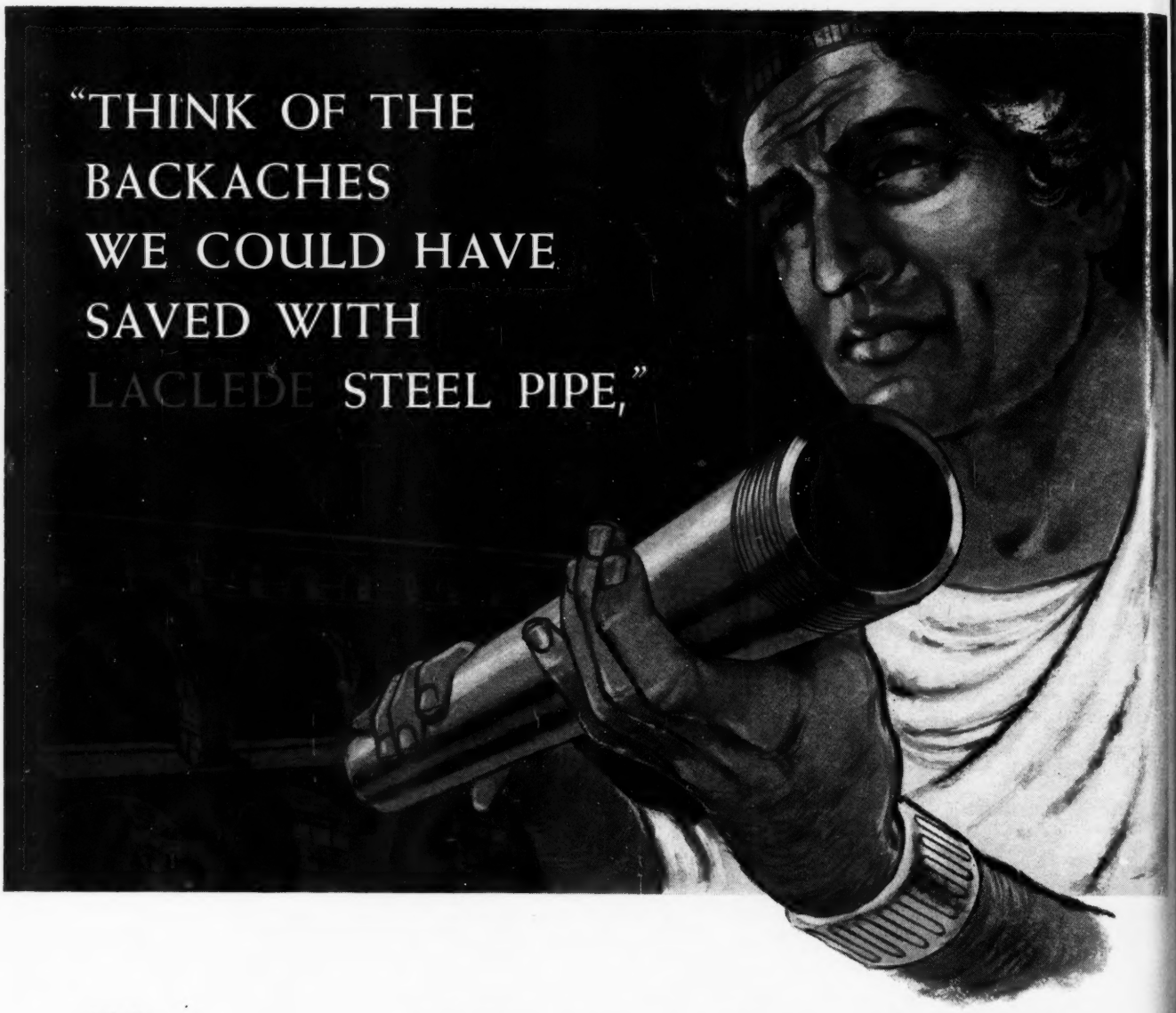

says
Q. Flavius Ferrus,
prominent
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contractor.

"I don't know how many work-hours my men lost from backache, lugging all that heavy stone to build those big, cumbersome arches. Strong, easy to handle Laclede Steel Pipe would have solved our water supply problem with a minimum of time and labor. And by Jupiter, I bet we'd have saved enough rock to build a barbecue pit for every third Roman."

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Steel

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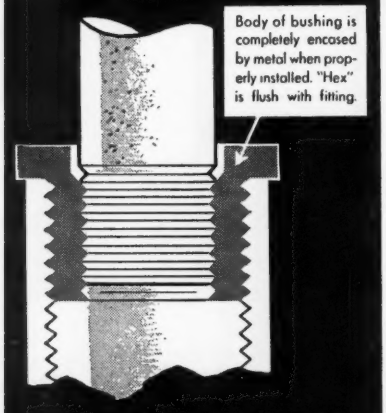

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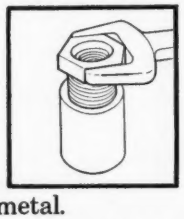
■ Sandwiched between two dissimilar metals, Mayco nylon dielectric bushings prevent metal to metal contact – stop *electrolytic* action!

Able to withstand pressures in excess of 1000 lbs. and temperatures over 300°F, Mayco dielectric bushings gain added strength from clamping action of surrounding metal.



Most sizes also available with extra-heavy "Hex" to facilitate use of ordinary wrench.

Couplings and unions also available factory equipped with Mayco bushings.

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Manufacturers of: MAYCO dielectric fittings and MAYCO water softeners and filters

Men At Work

● Recent organizational changes in the testing and inspection departments of A.-G.A. Laboratories in Cleveland, Ohio, include establishing a department of listing and approval services headed by **C. F. Geltz.** He is assisted by **F. H. Miller, H. C. Clark,** and **J. H. Fitzgerald,** section supervisors. **W. B. Pizzini,** former assistant chief standards engineer, has been appointed chief test engineer, and **S. L. Blachman** has been assigned to assistant chief test engineer. **P. D. Lawrence,** and **A. A. Kampman,** department engineers, will supervise the various test sections.

● Michigan Consolidated Gas Co. has appointed **Raymond J. Meurer** advertising and sales promotion manager. He was formerly Michigan counsel for American Broadcasting Station.

R. J. Meurer

C. C. Eeles

● **C. C. Eeles** has been appointed director of business promotion for the Columbia Gas System Service Corp. succeeding **W. W. Selzer,** who has resigned. Eeles will coordinate all residential, commercial, and industrial sales promotion activities of the Columbia Gas System.

● Following the resignation of **Ann McGinnis, George J. McCusker** has been appointed associated editor to represent Cambridge Gas Co. on the **NEGEA NEWS,** company publication of the New England Gas and Electric Association.

● Honolulu Gas Co. has appointed **Maynard B. Standley** residential sales supervisor. Formerly, he was sales manager for the eastern division of Cascade Natural Gas Corp. headquartered at Walla Walla, Washington. Standley is part of a 3-island reassignment of managerial duties; he succeeds **William Bonner** who moves to Kauai to become branch manager. Present Kauai manager, **Lester West,** becomes branch manager on Hawaii as **J. R. Detton,** now Big Island manager concentrates on specialized duties outside of the Hilo area.

● **A. J. MacKinnon** has joined Reynolds Gas Regulator Co. as Eastern area sales engineer. He will headquarter in Philadelphia.

● **Gene D. Tindall,** a native of the Texas Panhandle with experience in several different fields, has been named editor of *The Gas Jet,* employee magazine of Pioneer Natural Gas Co., succeeding **Harold Brown,** who has resigned.

● Sprague Meter Co. has appointed **Lloyd L. Grace** mid-west regional sales manager; he will maintain regional headquarters in Davenport, Iowa.

● Grove Valve and Regulator Co. has named **J. D. McNeill** sales engineer for Grove valves and pressure regulators in Canada. He will assist **Morley Davies,** who directs Grove's Canadian sales activities.

● **Roy R. Bush,** midwestern regional manager, has been elected sales vice president of Rockwell Manufacturing Co.'s meter and valve division.

● **Robert L. Wehrli,** vice president and general manager of Robertshaw-Fulton's Aeronautical and Instrument Division since 1956, moves to Richmond in January as vice president and assistant to the president of the corporation, **Thomas T. Arden. Raymond H. Heller** succeeds Wehrli as general manager of the Aeronautical division.

J. P. Viglini

A. B. Hemphill

● **John P. Viglini** has been named chief engineer for the transmission division of Lone Star Gas Co. and Lone Star Producing Co. succeeding **R. A. Minter** who has retired after 41 years with the company. **A. B. Hemphill** succeeds Viglini as assistant chief engineer.

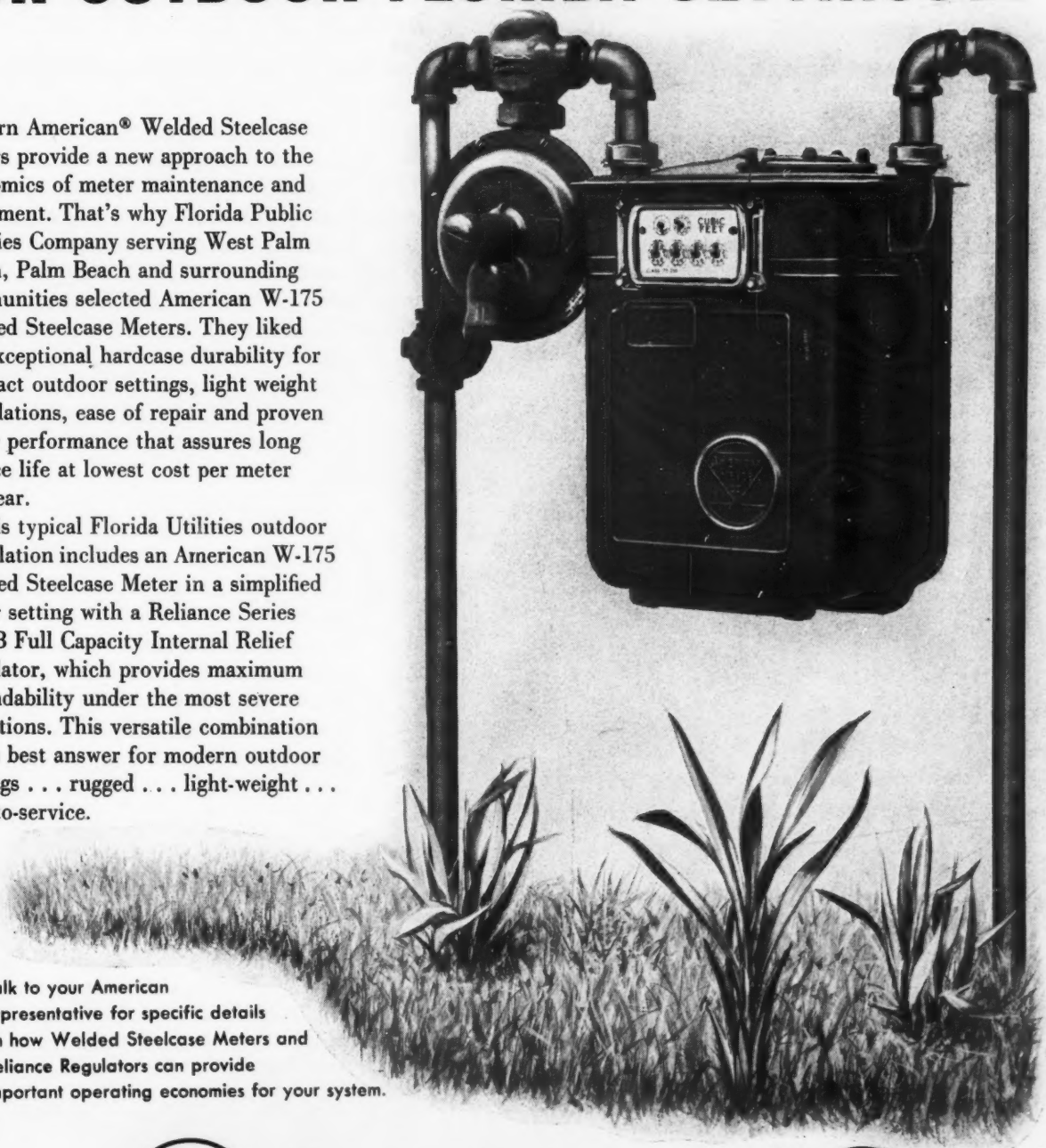
● Institute of Gas Technology has increased its number of trustees from 28 to 40. To fill the new positions, created because of the widening scope of IGT activities, 12 men were elected to the board. One-year-term-holders are: **William G. Hamilton, Jr.,** president, American Meter Co.; **Paul Kayser,** chairman, El Paso Natural Gas Co.; **W. E. Mueller,** president Colorado Interstate Gas Co.; and **G. J. Tankersley,** president, Western Kentucky Gas Co. Newly-elected for 2-year terms are: **J. H. Campbell,** president, Consumers Power Co.; **H. D. Clay,** president, Iroquois Gas Corp.; **Dale B. Otto,** president, New Jersey Natural Gas Co.; and **Peter J. Rempe,** president, Stone & Webster Service Corp. Four men elected for 3-year terms include: **William J. Harvey,** vice president, Public Service Electric and Gas Co.; **Robert W. Otto,** chairman, Laclede Gas Co.; **C. Pratt Rather,** president, Southern Natural Gas Co., and **Dr. E. H. Smoker,** president, United Gas Improvement Co. Elected to fill vacancies on the board were **Robert I. Wishnick,** chairman, Witco Chemical Co., for a one-year term; and for 3-year terms, **Donald S. Bittinger,** president, Washington Gas Light Co., and **Remick McDowell,** president, Peoples Gas Light and Coke Co.

● **Richard E. Robb,** industrial relations director of Honolulu Gas Co., has been named a vice president of the utility. **David C. Vaughan** has been appointed assistant secretary.

COMPACT WELDED STEELCASE METERS FOR OUTDOOR FLORIDA SETTINGS!

Modern American® Welded Steelcase Meters provide a new approach to the economics of meter maintenance and retirement. That's why Florida Public Utilities Company serving West Palm Beach, Palm Beach and surrounding communities selected American W-175 Welded Steelcase Meters. They liked the exceptional hardcase durability for compact outdoor settings, light weight installations, ease of repair and proven meter performance that assures long service life at lowest cost per meter per year.

This typical Florida Utilities outdoor installation includes an American W-175 Welded Steelcase Meter in a simplified meter setting with a Reliance Series 1413B Full Capacity Internal Relief Regulator, which provides maximum dependability under the most severe conditions. This versatile combination is the best answer for modern outdoor settings . . . rugged . . . light-weight . . . easy-to-service.



Talk to your American representative for specific details on how Welded Steelcase Meters and Reliance Regulators can provide important operating economies for your system.

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AMERICAN® METER COMPANY

INCORPORATED (ESTABLISHED 1836)

GAS EQUIPMENT MANUFACTURERS ASSOCIATION GEM MEMBER

GENERAL SALES OFFICE: Philadelphia 16, Penna. • Albany • Atlanta • Baltimore • Birmingham • Boston • Chicago • Dallas • Denver • Erie • Houston • Kansas City Los Angeles • Minneapolis • New York • Omaha • Pittsburgh • San Francisco • Seattle • Tulsa • Wynnewood. **IN CANADA:** Canadian Meter Company, Ltd., Milton, Ontario Calgary • Edmonton • Montreal • Regina • Vancouver. **SUPPLIERS TO THE GAS INDUSTRY** for Ironcase, Tinned Steelcase, Aluminumcase, and Welded Steelcase Meters • American-Westcott Orifice Meters • Instruments • Reliance Regulators • Apparatus • Valves

"DOES WORK OF TWO DITCHERS HANDLING ALL 3 OF MY JOBS"

Pipeliner Pete Gallatin calls Barber-Greene Model 774 Ditcher "most modern, advanced construction machine...completely new ditching concept"

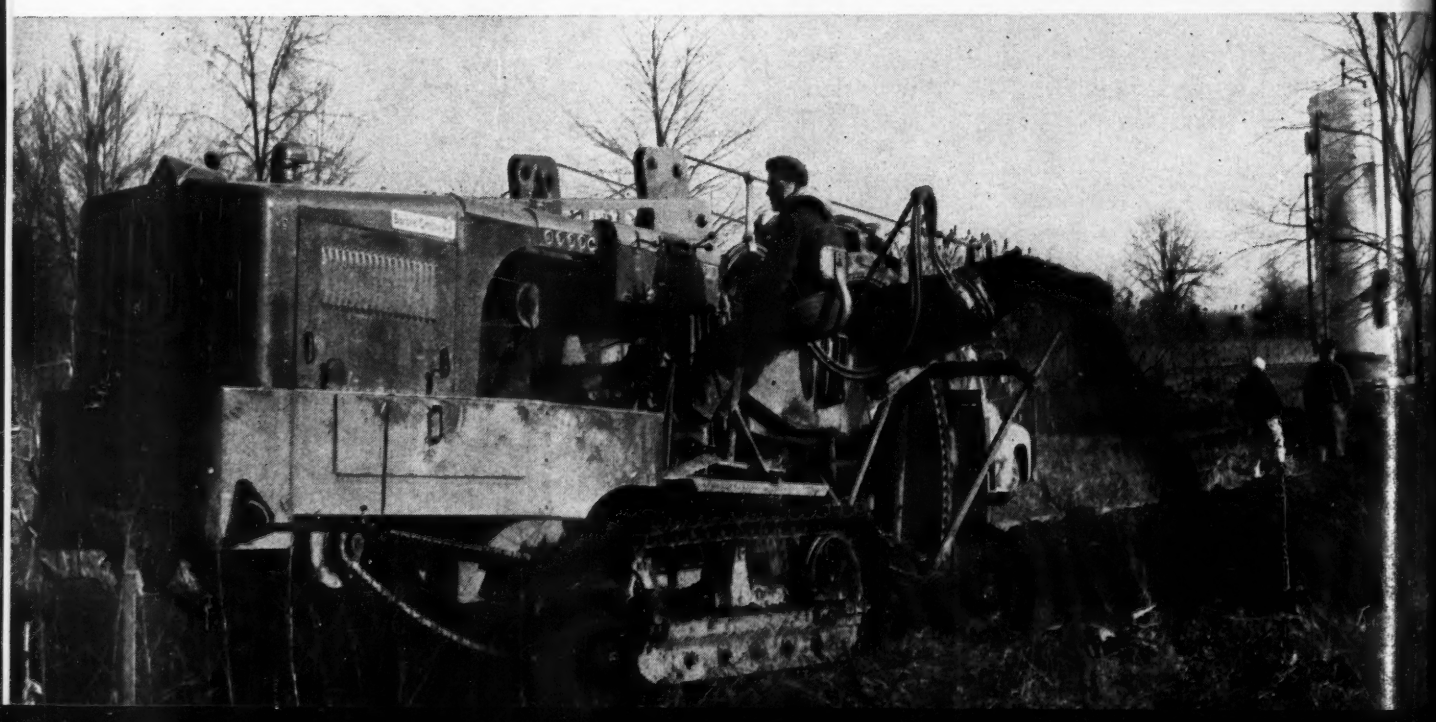
Pipeline construction company president Pete Gallatin knows increasing ditching production by 100% is as easy as changing machines—stepping up to a Model 774 Barber-Greene with 7-ft. wheel—the industry's biggest buy because it outdigs and costs 50% less than any other 7-ft. ditcher.

He reports: "My company handles virtually every phase of pipelining and for five years I used other ditchers. But this Model 774 Barber-Greene opened my eyes from the start—does the work of two same-size ditchers and trenches so fast I can keep all three of my jobs in Michigan and Illinois moving by shuttling it back and forth. It not only gives me 100% more production, but it excavates boulders and rocks far easier than other ditchers I owned. For my money, it's the most modern, advanced construction machine on the market with a completely new concept of digging—not just an alteration to existing equipment."

Exclusive dual-range Hydra-Crowd transmission makes the big difference. Operators dial *instantly* the maximum crowding speed for any ground condition, or reverse *instantly*, too. They select from *infinitely variable* crowding speeds *independent* of wheel and conveyor drive. No four-operation gear shifting. No guessing about gear ranges. No stopping to change speeds.

Check with your Barber-Greene Distributor and see why Hydra-Crowd and these additional features are found exclusively in the only modern ditcher line: Flexible drawbar between chassis and boom; all-hydraulic spoil conveyor independent of wheel speeds; hydraulic controls for greater line-and-grade-holding accuracy; crawler adjusted 10 times faster than those on ordinary ditchers; and automatic electric overload protection.

Barber-Greene 774 has ditched more than 50 miles for Gallatin by being shuttled between Michigan and two Illinois job sites.



Gallatin's 774 is shown digging trench for gathering lines for Marathon Pipeline Co., near Mosherville, Michigan.

Model 772 (shown) is your best buy for the general utility range—cutting widths from 10-24" and to 5' 6" deep. Model 773 varies only in its wider track gauge.

Manufacturer of the only modern ditcher line

Representatives in Principal Cities of the World

Barber-Greene BG

Main Office and Plant AURORA, ILLINOIS, U. S. A.
Plants in DeKalb, Illinois..Detroit..Canada..England..Brazil..Australia

CONVEYORS • LOADERS • DITCHERS • ASPHALT PAVING EQUIPMENT

FOR LONG LASTING BOND

Coating and wrapping under Ideal Conditions at *SPI*

When your pipe reaches this coating and wrapping machine at SPI, all moisture, rust and scale has been removed by warming and steel grit cleaning in temperature controlled rooms. The primer has been applied immediately after cleaning, to the steel grit cleaned surface made up of many tiny facets, to seal out all dirt, dust and moisture.

Exacting temperature control of enamels and surroundings and temperature and moisture control of wrappings under Standard Procedures result in ideal, long lasting bond of coatings and wrappings to your pipe.

For best protection to your pipe, use Standard Pipeprotection c/w pipe.

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SP®
standard pipeprotection inc.
3000 SOUTH BRENTWOOD BLVD. • ST. LOUIS 17, MISSOURI

Men at Work

● Northern Illinois Gas Co. recently named **Spencer R. Milliken** research director to succeed **Earl L. Tornquist,** who plans to retire next April 1. Formerly Milliken was manager of metallurgical and minerals research for Foote Mineral Co. of Berwyn, Pennsylvania.

S. R. Milliken

W. W. Selzer

● **W. W. Selzer** has been elected vice president in charge of marketing for Western Kentucky Gas Co. In his new post, he will be responsible for company's merchandising sales, gas air conditioning sales, advertising, sales promotion, home service program, public relations, industrial development, service utiliaztion and training.

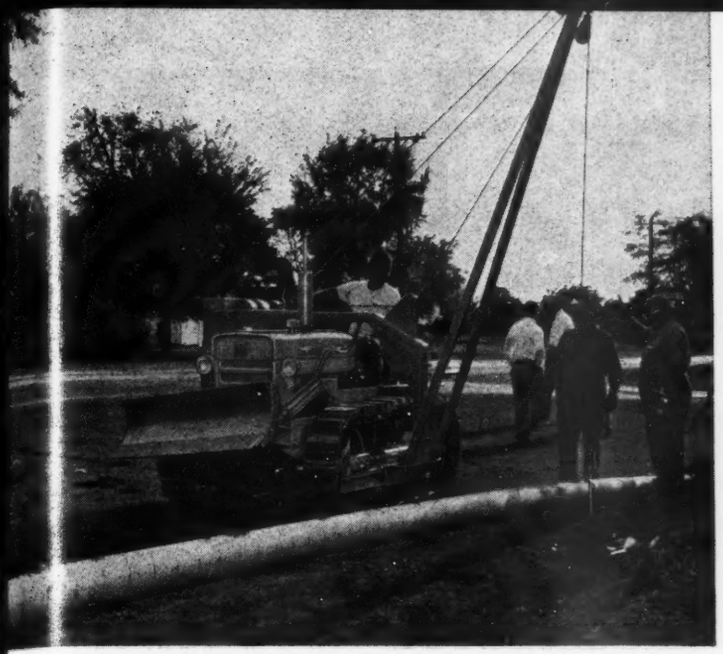
● Pioneer Service & Engineering Co. has announced the election of **W. C. Drummond** as president of the company to succeed Fred C. Kellogg, deceased. Drummond was formerly vice president in charge of engineering of the company.

● New title of corporate and public affairs department has been assigned by Whirlpool Corporation to its public relations department in order to define more accurately, recently expanded responsibilities and functions. **Juel M. Ranum,** who has served in dual capacity of assistant to the chairman of the board and director of public relations, will devote full time to the expanded department as director of corporate and public affairs. **Robert W. Brooks,** currently product manager of sales to Sears, Roebuck & Co. at St. Paul will become assistant to the chairman.

● **Sol Goldin,** manager of retail marketing for Whirlpool Corp. has been named president of the Institute of Appliance Manufacturers, national trade association for manufacturers of all types of major appliances and their suppliers.

● **James J. Condon** has been elected assistant vice president-sales division for The Peoples Gas Light and Coke Co. Succeeding him as manager of domestic sales department is **Robert L. Ingeman,** now manager of the commercial sales department. **Francis J. Dawson,** former supervisor of industrial sales, has been promoted to manager of commercial sales. Also recently announced was the promotion of **William Trebs,** assistant industrial sales development engineer, to industrial sales development engineer, industrial sales.

● **Arnold L. Buehl** has been appointed director of engineering for Hotstream Heater Company, manufacturer of domestic and commercial water heaters. He will be responsible for a program of basic research and development, and will direct design and preparation of specifications for new products.



One of three International T-340 crawlers used by a prominent Midwest utility company for laying distribution lines. The T-340 shown laid 6,000 feet of six-inch main, replacing a 67-year-old four-inch line on this particular job.

Save the expense of an additional tractor by using the T-340 boom tractor for backfilling. Six-foot blade is hydraulically controlled. It can be angled manually 25 degrees right or left for bedding down the pipe safely.

Husky, low-cost 47-hp* crawler...

handles line pipe up to 6 inches

Now you can have crawler tractor pipe-handling at a cost-cutting price for the multitude of jobs requiring 6,500-lb sideboom capacity or less. International T-340 is priced thousands of dollars less than the next larger size sideboom crawler.

With 66-inch track length ground contact, the T-340 has excellent flotation in soft footing with 10, 12 or 14-inch shoes as conditions require. Bolt-on rubber shoes permit work on city streets without damage to pavement. Compact size of tractor makes job-to-job moves by small trailer fast and easy.

On jobs where you now use larger or less efficient power, you'll often find that a husky, hustling T-340 or TD-340 will cut costs to the bone. Ask your nearby IH dealer for complete specifications, or write International Harvester Co., Dept. AGJ-1., P.O. Box 7333, Chicago 80, Illinois.

**Maximum engine hp corrected to standard conditions*

Twelve-foot boom gives the T-340 "boardinghouse" reach so that the tractor can remain on firm footing in rugged terrain. Constant load control prevents accidental dropping.

INTERNATIONAL HARVESTER

Here's a pipe coating trio for really tough conditions

For severest exposure conditions—where corrosive problems are *really* tough—Dearborn now offers a cold-applied pipe coating trio that will virtually pay for itself in extended pipe service life.

NO-OX-ID® "GG" in combination with No. 4 NO-OX-IDIZED® Wrapper and NO-OX-ID Filler Red "C" provides long life protection for industrial plant piping regardless of atmospheres or other surrounding conditions.

It is unaffected by water, water vapor or chemical fumes . . . withstands temperatures up to 120°F . . . may be used around air lines, sprinkling systems, cold water piping, gas lines . . . dries to a dense, tough, plastic coating . . . easily applied without special equipment.

This trio is an essential in any maintenance program. Write today for Bulletin 3200 giving technical and application details. Or call your nearest Dearborn representative.

DEARBORN CHEMICAL COMPANY

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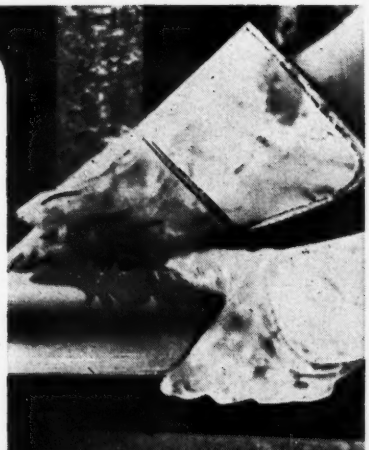
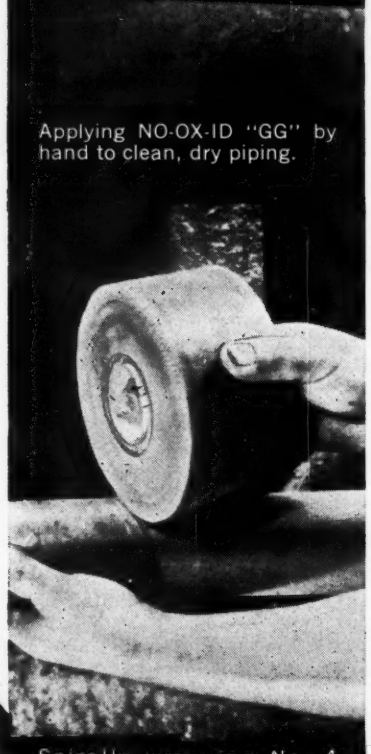


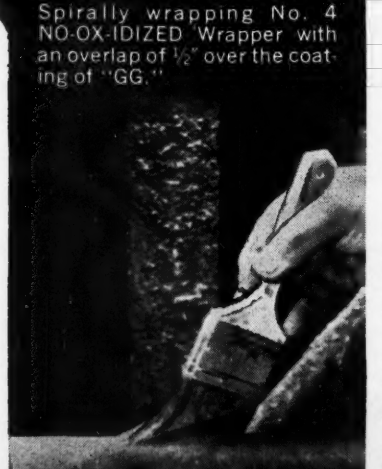
NO-OX-ID "GG"

Applying NO-OX-ID "GG" by hand to clean, dry piping.



NO. 4 NO-OX-IDIZED WRAPPER

Spirally wrapping No. 4 NO-OX-IDIZED Wrapper with an overlap of ½" over the coating of "GG."



NO-OX-ID FILLER RED "C"

Applying NO-OX-ID Filler Red "C" over the No. 4 Wrapper.

Men at Work

● **John Huber** has been appointed assistant director of sales for the Heating and Air Conditioning Division of Controls Company of America. **Perry Cremeens,** former sales engineer for the district, succeeds Huber as manager of the division's midwestern sales district.

Jack Huber

D. L. Armstrong

● **Donald L. Armstrong** has been appointed to direct engineering activities of Reynolds Gas Regulator Co., Inc., succeeding **George Hughes,** former Reynolds chief engineer who recently resigned to accept another position in the gas industry. Armstrong will direct both research and application engineering for the firm.

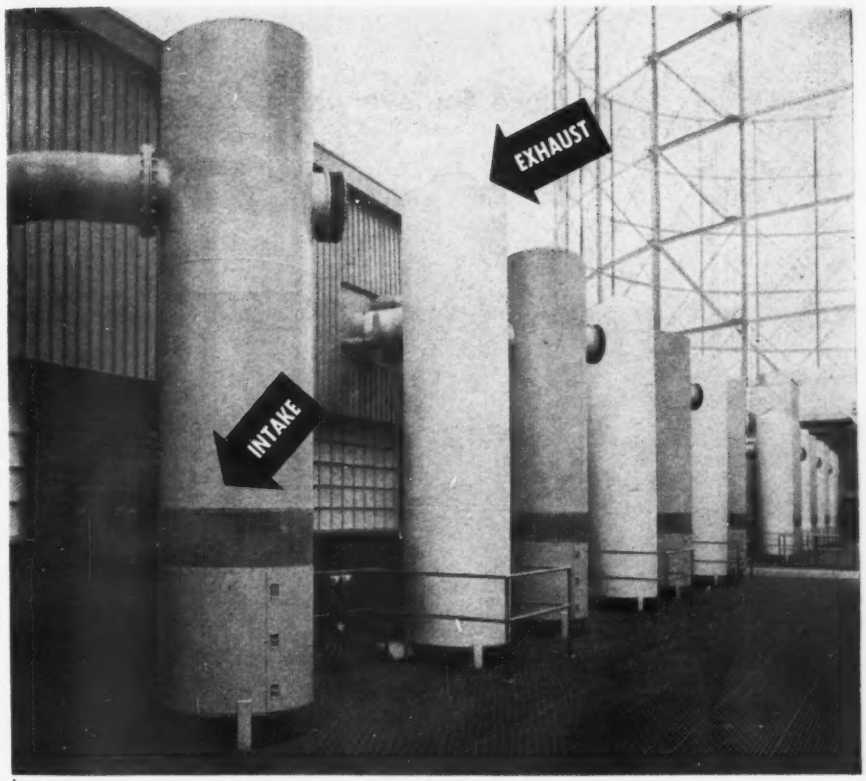
● Laclede Gas Co. has announced several promotions in the sales department: **Chester H. Davisson,** merchandise manager, to manager of residential and dealer sales; **William A. Otten,** dealer sales representative, as assistant manager of dealer sales; **Joel C. Weddell,** district supervisor in domestic sales, to assistant manager in residential sales; and **William M. Barry,** representative in the new construction department on small-tonnage air conditioning, to sales promotion manager.

● **William J. Schmidt,** assistant vice president, sales, has retired from Long Island Lighting Co. October 1 after more than 28 years of service.

● Marbon Chemical Div., Borg-Warner, has announced the appointments of **William A. Suiter** and **Rhoda M. Stewart** as vice presidents. Suiter has served as Cycolac resin sales manager; in his new capacity he will be responsible for all product sales activities, including rubber resins, latex, and adhesives. Miss Stewart has served as director of purchases; current change places the personnel department under her direction.

● **Harold W. Clift,** vice president in charge of gas and electric operations for Delaware Power & Light Co., has been assigned the additional responsibilties for the company's construction program, formerly under the direction of vice president **R. B. Richardson,** who recently retired. Duties of secretary, relinquished by **A. T. Gardner** when he became president last month, are being performed by treasurer **William A. Hibbert** since his election to the dual responsibilities of secretary-treasurer.

● **Richard W. Camp,** former president of Consolidated Gas Utilities Corp., has been elected a vice president of Arkansas Louisiana Gas Co.; he will direct activities in the new Oklahoma-Kansas Division of Arkla Gas. Since merger of Consolidated Gas with Arkla Gas in August, Camp has been manager of the Oklahoma-Kansas Division which encompasses territory formerly served by Consolidated.



Eight SILENT TWINS Team Up To Eliminate Neighborhood Noise At California Gas Compressor Station

Rigid noise level requirements were issued by Southern California Gas Company for their Ducommun Street Station in the heart of Los Angeles. Burgess-Manning designed to the specifications, and guaranteed the performance of eight Silent Twins that were installed on each of eight Ingersoll-Rand gas engine driven compressors in the plant.

Silent Twins, matched units for remote-mounted or engine-mounted turbochargers, provide clean, filtered intake air at minimum pressure drop and maximum silencing efficiency on both the intake and exhaust sides of the system. Available for vertical or horizontal installation, they afford flow-conditioned, compact piping for best operating efficiency.

Silent Twins can be furnished with either two types of filters: a petrolatum-treated hogshair, used on the Gulf Coast, the Eastern United States, and other light dust load areas; for heavy dust load areas, we recommend a special felt material that will hold or load up with dust and dirt of a very small micron size.

Burgess-Manning Silencers are scientifically engineered to prevent — not muffle — exhaust noise of internal combustion engines, discharge of rotary blowers, and the intake of reciprocating compressors and rotary blowers. Silencing is obtained by passing the flow through snubbing chambers so that it is discharged to atmosphere smoothly and quietly. Burgess-Manning Snubbers are built like pressure vessels, continuously welded throughout, without excessive weight. A wide range of both standard and special units is available for 1" through 30" and larger pipe sizes.

In our more than 50 years' research and engineering for all types of industries, we have never failed to solve a noise problem. If noise is a problem in your plant, talk to "The Sound Engineering People." There's no obligation, and you'll find us anxious to help you in any way we can. Burgess-Manning Company, 9245 Sovereign Row, Dallas 7.

SILENT TWINS

MATCHED UNITS for AIR FILTER / INTAKE / EXHAUST

Industrial Silencer Division

BURGESS-MANNING COMPANY

The Sound Engineering People

Sales Engineering Representatives World-Wide

A place for everything . . . everything in its place . . .

STANDARDIZED

Most important step in establishing a standardized truck loading program at Southern Counties Gas Co. was stripping customer service trucks of all supplies before restocking them with a standardized load. Here, in the utility's Santa Monica Bay division, fieldmen Chet Stinson, John Erdag, Harold McVey and Floyd DeLuca are shown at work.

You've all heard about Fibber McGee and his notorious closet, the one that cried out for a standardized loading system but never got it.

Southern Counties Gas Company's service trucks weren't in the same class as the McGee closet by a long shot, but through the years, the habits of individual servicemen had resulted in accumulations of equipment that left some trucks overequipped and others underequipped.

The company's customer service department staff took a good look at the situation some time ago and decided to set up a program of standardized truck loading. Their reasons were principally three:

1. **To keep the amount of material carried on trucks within a reasonable limit.** Many fieldmen have a tendency to collect materials and to carry more fittings and tools than are actually needed.

2. **To make it easier for a fieldman to work with any truck that he might be assigned.** There is always a certain amount of switching in truck assignments, brought about by changes in shift schedules, emergency call-outs, rotation of radio runs, vacations, or equipment breakdowns. Under a standardized loading program, the fieldman can be confident that when he is assigned to an unfamiliar truck he will find it adequately equipped for all his needs.

3. **To increase efficiency.** Having a place for everything and everything in its place increases efficiency, cuts down waste time spent searching for equipment, and allows the foreman to inventory and check truck equipment more easily. In short, it's just plain better "housekeeping," as any housewife with a neat broomcloset can tell you.

Setting Up Program Not Easy

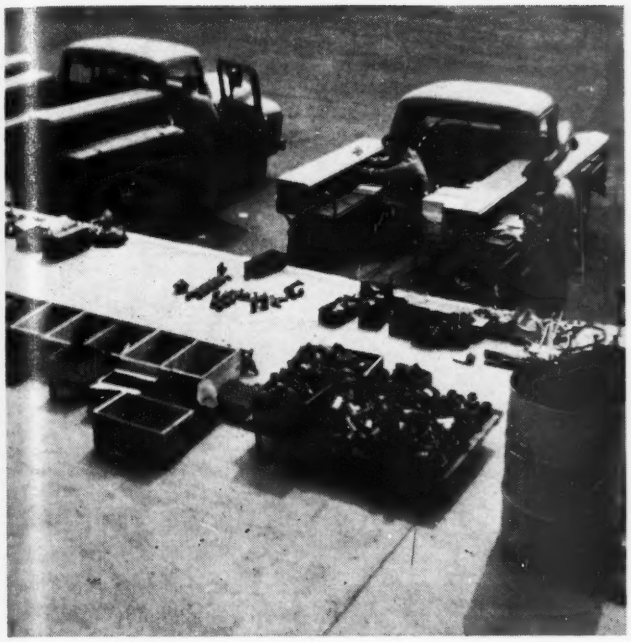
It's not the easiest thing in the world, however, to set up and to put into effect such a standardized loading program. The Southern Counties people first had to set up certain guidelines consisting of procedures and forms to be used in making the changeover and then in maintaining the effectiveness of the program on a continuing basis.

In collaboration with the supervisors from each of the company's eight operating divisions, standard truck loading charts were made up for tools, fittings, and other materials for each type of truck body. The *Powers* and *Utility* bodies are the principal types in use in the company, but there are also a limited number of a third special type of truck for changing old age meters. These, too, had to have standardized loadings established for them.

In addition, separate loading charts had to be prescribed for the two job classifications regularly using the trucks: *Meterman* and *Serviceman*. Thus, there were four different basic equipment inventories covering the two principal types of trucks, plus one more for the Periodic Meter Change truck.

One complication of the program that had to be faced and solved is the difference in the nature of work in different geographical areas. For instance, in areas of heavy growth, where meter setting is a major part of customer service work, the equipment would have to be different from that in more settled areas, where work such as on and off orders and appliance servic-

TRUCK LOADING



After stripping the trucks, the Southern Counties' crews reloaded them again to the prescribed standardized pattern. Here, Ernie Partl and Tom Milliron (at work on truck at right) do the job at the firm's Santa Monica Bay division.

Southern Counties' truck loading program has won approval from servicemen for the neatness and ease of accessibility of all parts tools. Here Larry Kick, Eastern division customer service foreman (left), and Jack Terry, Eastern division customer service supervisor, examine the equipment on a Utility type truck.

ing constitute the greater part of the work load. Thus, a Meterman in one area might need a relatively large assortment and quantity of fittings, whereas in another area only a limited number would be required.

To solve this problem, a minimum and maximum number of fittings to be carried on each truck was specified, and the actual number of fittings carried, within these limits, was left to the judgment of each fieldman, based on his work needs and experience.

Maintaining Standard Loads

It was found from initial studies that one of the key requirements of standardized loading was to establish some means of replenishing supplies on a daily basis.

In the larger base locations this need was met by a morning loading procedure established by the company's stores department. Under this procedure, the fieldman at the end of each day turns in a requisition for fittings and materials to bring his truck up to normal. This requisition goes to the dispatch unit, where orders are routed by the night dispatcher for the next day's work.

The night dispatcher, after he has made up the next day's routes, adds to each individual requisition the meters and meter setting materials to be loaded to take care of the meter set or change orders that he has routed to each particular truck. The material as shown on each requisition is loaded by stores personnel early in the morning before the normal workday begins.

At the same time, any excess fittings or material that the fieldman may have accumulated during the previous day and has indicated on the requisition that he wants unloaded will be picked up. This latter step prevents a build-up of unneeded material.

The fittings for meter sets are prepackaged in burlap bags, which are identified by meter size and type by a color sprayed on the bag. This allows stores personnel to quickly load meter fittings in accord with the type and size of meter to be used. In addition to meters and meter set fittings, the night dispatcher can also have other items such as appliance parts loaded on trucks to conform with any *Parts Orders* dispatched for the next day.

In the smaller outlying bases where stores personnel are not employed, each fieldman handles his own loading and unloading. However, the same standards of truck loading apply with the only difference being the method of getting the materials on and off the truck.

As a part of a continuous training program, customer service's regular quality control program calls for foremen to make field rides with each of their fieldmen at least twice a year at approximately six-month intervals. At this time, the foreman reviews and checks the truck loading. Once a year, a complete truck and portable tool inventory is made.

Primary Objective: Standards

Although the control of truck loading, of course, is important, customer service manager Al Petersen points out that the primary objectives of the program were to establish standards that would allow fieldmen and supervisors to know what constituted proper truck loading, to make trucks more inter-

TRUCK LOADING CHART . . . *Serviceman Body, Curb Side*

COCKS	COUPLINGS	ELLS	RED ELLS	TEES	RED TEES	SWIVELS & NUTS CURB	SWIVELS & NUTS IRON CASE	SWIVELS & NUTS TIN ELL (8-20) OFFSET (8-20)	GASKETS IRON CASE 5 LT. 10 LT. 20 LT. TIN 5 LT. CURB 5 LT. 20 LT.	NIPPLES	NIPPLES	NIPPLES
1018 3/4" (2-4) UNIONS 3/4" (2-4)	1/2" (0-2) 3/4" (2-8) 1" (2-6) 1 1/4" (1-2)	3/4" (8-15) ST. ELLS 3/4" (2-6)	3/4"x1/2" (6-10) 1"x3/4" (4-8) 1 1/4"x3/4" (2-4)	3/4" (6-10) ST. TEES 3/4" (1-3)	3/4"x3/4"x1/2" (6-10)	1" (4-20) 1 1/4" (2-4)	3/4" (4-20) 1 1/4" (2-4) 1 1/2" (0-4)		5 LT. 10 LT. 20 LT. TIN 5 LT. CURB 5 LT. 20 LT.	3/4" Cl. (4-8) 3/4"x2" (6-10)	3/4"x3" (6-10) 3/4"x4" (6-10)	3/4"x5" (6-10) 3/4"x6" (6-10)

HAND DRILL
CHIPPING GOGGLES
HACK SAW
10" PIPE WRENCH
14" PIPE WRENCH
18" PIPE WRENCH
HAND TROWEL
HAND CLEANER

OIL CAN
PIPE CUTTER
1/2"x3/4" SCREW EXTRACTOR
PICK AND HANDLE
CLAW HAMMER
SPOT LIGHT
PIPE REAMER
PIPE THREADERS

NIPPLES
3/4"x8" (6-10)
3/4"x9" (6-10)
3/4"x10" (6-10)
3/4"x12" (6-10)
4"x4" PIPE BENDS (6-12)

COVERALLS
RAIN GEAR
PERSONAL

DUPLEX
BOX

PAINT
PIPE
RAGS

(MIN. - MAX.)

Everything in its place and a place for everything —that's the motto of Southern Counties truck loading program. Here Eastern division customer service foreman Larry Kick (left) and customer service supervisor Jack Terry examine the equipment on a truck.

MANUAL HOLDER

PRACTICAL ELECTRICITY MANUAL	
HANDBOOK	HANDBOOK
CODE BOOK	A.G.A. MANUAL
MINN. HONEYWELL CONTROLS VOL. #1 & #2	INDIVIDUAL ENVELOPES CONTAINING
SERVEL MANUAL 214	#1 — 481 #3 — 466 #2 — 508 — 510 #4 — 403

FORMS HOLDER

AFTER HRS.	ENVELOPES	70 & 70.1	(6)	159	(5)
13	(10)	80	(3)	521	(1 Pad)
14	(25)	312	(3)	382	(5)
		522	(3)	546	(3)
78	(25)	467	(6)	552	(3)
79	(10)	391	(10)	276	(1 Pad)
385	(20)	392	(15)	471	(20)
18	(10)	12	(15)	498	(10)
535	(10)	*45-T	(10)	**45	(1 Pad)
WINDOW ENVELOPES	(10)				

GLOVE COMPARTMENT
A-1 CL-11 CL-33
A-3 CL-16 CL-34
C-1 CL-17

*I.B.M.
**UNDERWOOD SUNSTRAND
( ) MAXIMUM AMOUNT

Loading Charts for manual holder and forms holder found on service trucks.

TRUCK LOADING CHART . . . *Serviceman Body, Street Side*

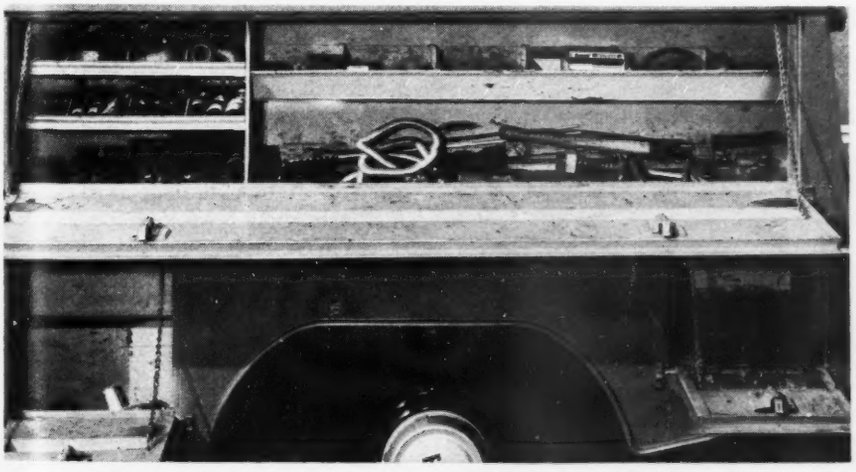
BUSHINGS	COCKS	ELLS	RED ELLS		
1"x½" (1-3)	1018	1"	1¼"x1" (2-2)	REFRIGERATOR WIRE BRUSH	RANGE VALVE HANDLES
1¼"x½" (1-2)	1"	(4-8)	1½"x¾" (0-2)	HAND BELLOWS	PILOT ASSEMBLY
1¼"x1" (1-2)	(1-2)	1¼"	1½"x1" (1-2)	PIPE BENDER	ALUMINUM TUBING
INSULATING	UNIONS	(1-4)	1½"x1¼" (1-2)	PICK AND HANDLE	REFRIGERATOR BURNERS AND BRACKETS
1"x½" (1-2)	1"	1½"	2"x1" (0-1)	SHOVEL	
CAPS	(1-2)	(0-1)		FLUE BRUSH	
½" (1-3)	1¼"	ST. ELLS		FLEX CONNECTORS AND VALVE	
¾" (4-6)	(1-1)	1"		UNIVERSAL OVEN DOOR HANDLES	
1" (1-2)		(2-2)			
1¼" (1-1)		1¼"			
		(1-2)			

NIPPLES	NIPPLES	NIPPLES	NIPPLES
½"xCl.	1"xCl.	1"x5"	1¼"xCl.
(0-2)	(1-4)	(6-8)	1¼"x2"
½"x2"	1"x2"	1"x6"	1¼"x3"
(0-2)	(1-4)	(6-10)	1¼"x4"
½"x3"	1"x3"		1¼"x5"
(0-2)	(1-4)		1¼"x6"
½"x4"	1"x4"		(1-4)
(0-2)	(1-4)		
½"x5"			
(0-2)			
½"x6" (0-2)			

PLUGS	REDUCERS	TEES	RED TEES
⅛" (0-2)	¾"x½" (1-2)	1"	1"x1"x¾"
¼" (0-1)	1"x¾" (1-4)	(4-8)	(1-2)
½" (2-3)	1¼"x¾" (1-2)	1¼"	1¼"x1¼"x¾"
¾" (6-8)	1¼"x1" (1-2)	(1-4)	(1-2)
1" (6-8)	1½"x1 (0-2)	1½"	1¼"x1¼"x1"
1¼" (1-2)		(0-1)	(1-2)
1½" (0-1)			

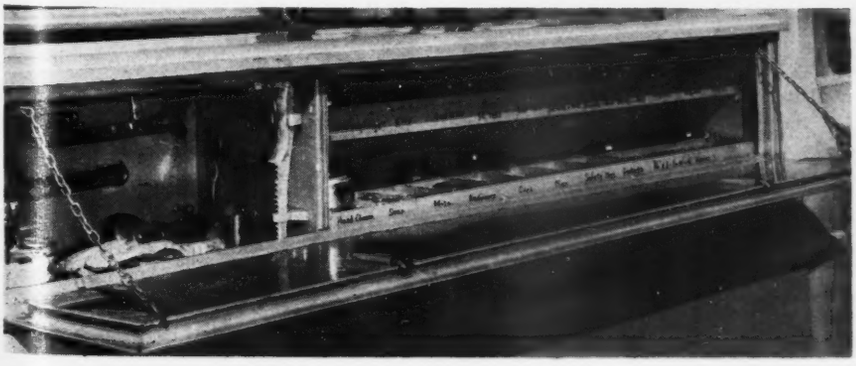
REGULATORS
UMBRELLAS
DIATOG VALVE

PIPE SQUEEZER
±15 PIPE WRENCH
REDWOOD PLUGS
FRICTION TAPE
DUX SEAL



Street side close up of equipment on Utility type truck shows the standardized loading established under Southern Counties' new program.

Curb side of a Utility type truck shows how it is loaded under Southern Counties' new program.



changeable and easier to work from, and to simplify the loading and unloading procedures. With these objectives attained, much of the control will take care of itself.

"It's difficult," Petersen says, "to tell a fieldman he has too many of a particular fitting or tool if nobody has any precise idea of how many he should have. It sounds like a simple and fundamental principle of housekeeping, but it is surprising how much energy and time can go into establishing just such a program when such factors as differences in geographical location, workload, and work habits are involved."

Before the actual changeover process could begin, the customer service staff had to feel its way through a period of trial and error. The program grew out of a plan to revise the company's system of tool inventory. Seeing the opportunity to go ahead with standardized loading, the staff expanded its efforts in that direction and set up the outline and procedures essentially as described above.

Pilot Study Conducted

To make sure its procedures were practical, a pilot study was conducted in two divisions. The pilot studies in the two divisions proved the merit of the plan and it was decided to go ahead with it on a systemwide basis.

To put the program into effect as

TRUCK LOADING CHART . . . *Meterman Body, Curb Side*

COCKS	COUPLINGS	ELLS	RED ELLS	TEES	RED TEES	SWIVELS & NUTS CURB	SWIVELS & NUTS IRON CASE	SWIVELS & NUTS TIN ELL	GASKETS	NIPPLES	NIPPLES	NIPPLES
1018 ¾″ (2-4) UNIONS ¾″ (2-4)	½″ (0-2) ¾″ (2-8) 1″ (2-6) 1¼″ (1-2)	¾″ (8-15) ST. ELLS ¾″ (2-6)	¾″x½″ (6-10) 1″x¾″ (4-8) 1¼″x¾″ (2-4)	¾″ (6-10) ST. TEES ¾″ (1-3)	¾″x¾″x1½″ (6-10)	1″ (4-20) 1¼″ (2-4)	¾″ (4-20) 1¼″ (2-4) 1½″ (0-4)	(8-20) OFFSET (8-20)	IRON CASE 5 LT. 10 LT. 20 LT. TIN 5 LT. CURB 5 LT. 20 LT.	¾″ CI. (4-8) ¾″x2″ (6-10)	¾″x3″ (6-10) ¾″x4″ (6-10)	¾″x5″ (6-10) ¾″x6″ (6-10)

PIPE CUTTER
PIPE REAMER
PIPE THREADERS
OIL CAN
CHIPPING GOGGLES
SAFETY PLUGS
¾″—1″—1¼″

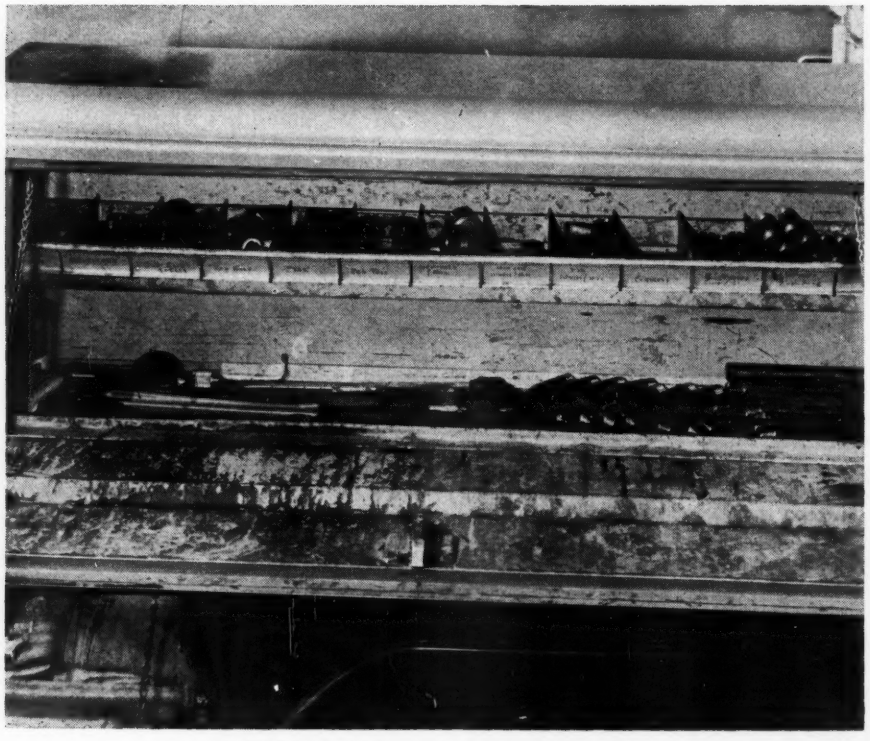
HACKSAW
18″ PIPE WRENCH
HAMMER
HAND TROWEL
WHISKBROOM
HAND CLEANER
RAGS

NIPPLES
¾″x9″ (6-10)
¾″x10″ (6-10)
¾″x12″ (6-10)
4″x4″ PIPE BENDS

COVERALLS
RAIN GEAR
PERSONAL

PAINT
PIPE
DOPE

(MIN. - MAX.)



Curb side close up of a Powers type truck shows loading prescribed under new program at Southern Counties Gas.

quickly as possible, a team of staff men worked wtih the division supervisors to make the changeover on a division by division basis. Each truck was completely stripped down and cleaned up, so that reloading according to the standardized program could be started "from scratch." It took the supervisory and staff team about a week to change over trucks in the larger divisions, about two days in the smaller ones. The entire changeover covered a six-week period.

Setting up the program also entailed calling on the company's stores and accounting departments for help. With cooperation and assistance from these departments, it was possible to revise methods and practices all along the line in conformity with the changeover.

The change also enabled customer service to revise its procedures for tool inventory and control. The tool portion of the requisition is now coded for IBM use and a report on tool usage and costs for each man will be provided in the future so that each man's tool turnover and usage can be more readily evaluated and controlled.

Program Is Flexible

Because the standard loading program is new, Southern Counties' customer service people expect changes to be made in it. They have asked the help of men in the field, both supervisory

TRUCK LOADING CHART . . . *Meterman Body, Street Side*

BUSHINGS	COCKS	ELLS	RED ELLS	BELLOWS AND HOSE PICK AND HANDLE SHOVEL
1"x3/8" (1-3) 1¼"x½" (1-2) 1¼"x¾" (1-2) INSULATING 1"x3/8" (1-2) CAPS ½" (1-3) ¾" (4-6) 1" (1-2) 1¼" (1-1)	1018 1" (1-2) UNIONS 1" (1-2) 1¼" (1-1)	1" (4-8) 1¼" (1-4) 1½" (0-1) ST. ELLS 1" (2-2) 1¼" (1-2)	1¼"x1" (2-2) 1½"x¾" (0-2) 1½"x1" (1-2) 1½"x1¼" (1-2) 2"x1" (0-1)	

NIPPLES	NIPPLES	NIPPLES	NIPPLES
½" x Cl. (0-2) ½"x2" (0-2) ½"x3" (0-2) ½"x4" (0-2) ½"x5" (0-2) ½"x6" (0-2)	1"x Cl. (1-4) 1"x2" (1-4) 1"x3" (1-4) 1"x4" (1-4)	1"x5" (6-8) 1"x6" (6-10)	1¼"x Cl. 1¼"x2" 1¼"x3" 1¼"x4" 1¼"x5" 1¼"x6" (1-4)

PLUGS	REDUCERS	TEES	RED TEES
⅛" (0-2) ¼" (0-1) ½" (2-3) ¾" (6-8) 1" (6-8) 1¼" (1-2) 1½" (0-1)	¾"x½" (1-2) 1"x¾" (1-4) 1¼"x¾" (1-2) 1¼"x1" (1-2) 1½"x1" (0-2)	1" (4-8) 1¼" (1-4) 1½" (0-1)	1"x1"x¾" (1-2) 1¼"x1¼"x¾" (1-2) 1¼"x1¼"x1" (1-2)

REGULATORS ¾" K VENT PLUGS DIATOG RELIEF VALVES UMBRELLAS	

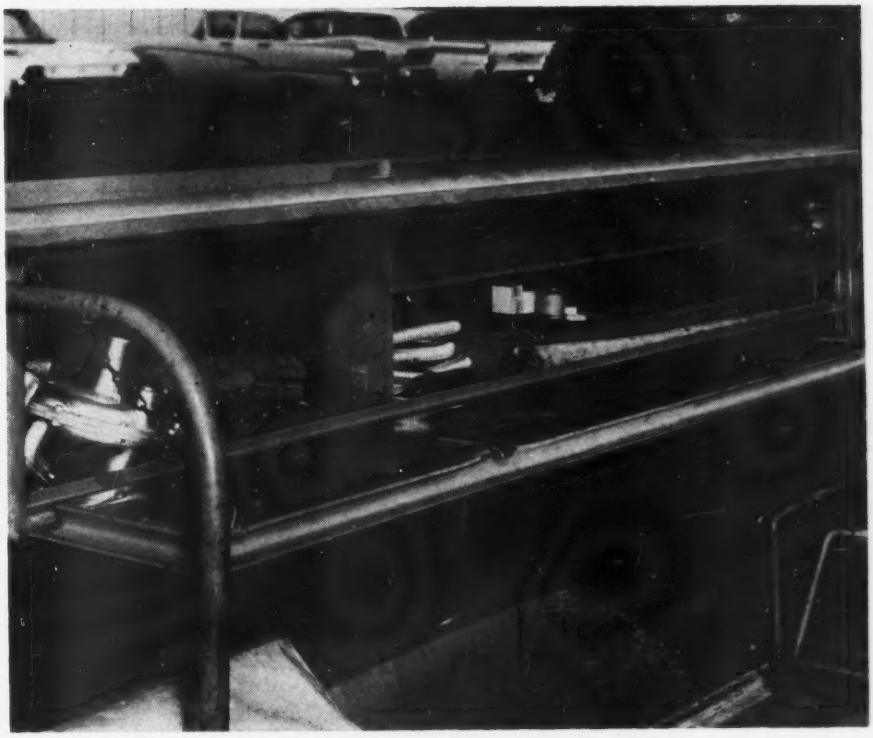
and non-supervisory, in submitting observations and suggestions for improvement of the program in all its aspects.

But the major effort, the big "housekeeping" job, has been done, and that's a good deal more than half the battle. More than three-hundred service trucks were changed over and it is estimated that over 25 tons of excess fittings and material were removed.

A good example of immediate benefits under the new program came when a service truck, which appeared to have a weak spring, was unloaded and then reloaded according to the new program. As soon as the prescribed reloading had been accomplished, the truck spring returned to its normal position.

By the time the changeover had been effected, most of the fieldmen throughout the company were convinced of the program's value. Many said they found that their trucks handled better and seemed lighter. They appreciated the good housekeeping aspects of the program, particularly the fact that standardized loading enabled them to switch trucks, if necessary, and still find the basic fittings and tools to do their jobs.

Customer service manager Petersen ascribes a large part of the success of the program to the cooperation received from the division supervisors and fieldmen and to the help given by the other departments involved. * * *



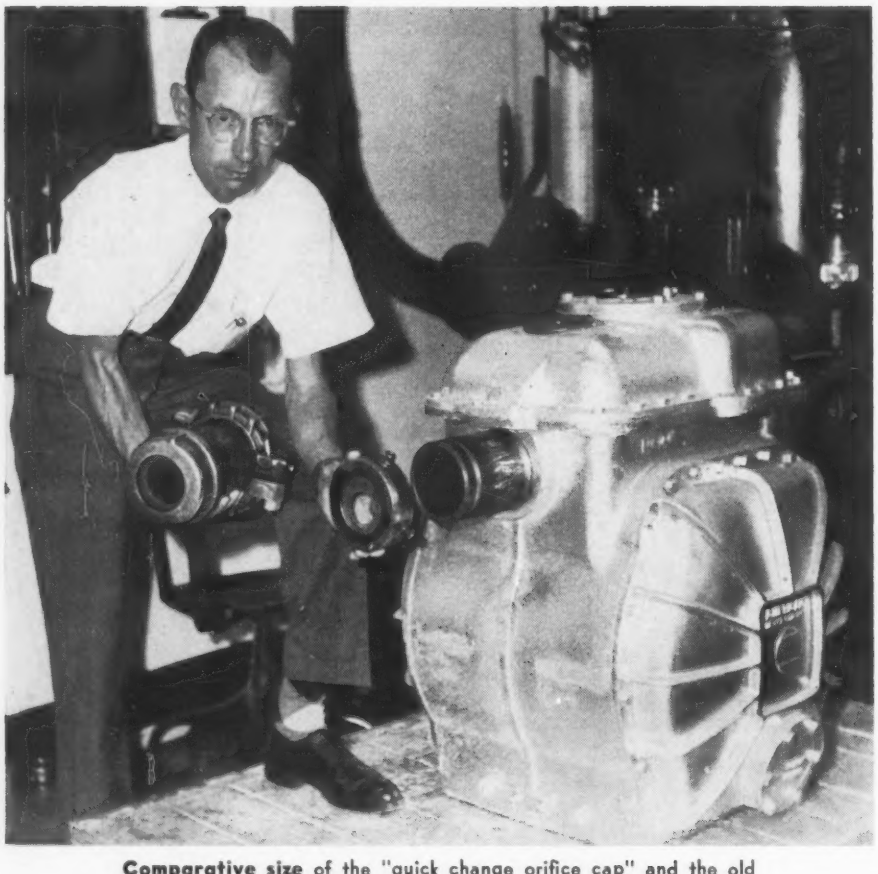
Street side compartment of Powers type truck shows fittings and equipment as stored under standardized program.

At Mountain Fuel Supply Company

THE QUICK CHANGE ORIFICE CAP

Helps speed testing of large meters

Harold R. (Hal) Heath,
Meter Shop Foreman
Mountain Fuel Supply Company
Salt Lake City, Utah



Comparative size of the "quick change orifice cap" and the old Victaulic coupling device (larger of the two) that it replaces is shown by Harold R. (Hal) Heath, meter shop foreman at Mountain Fuel Supply Company. Devices are used to attach orifice plates to meters being proof tested.

Shop testing of positive displacement meters — rather than field testing — is far more convenient and desirable, believes Mountain Fuel Supply Company, the major natural gas utility in Utah. Under regulations adopted by the Utah Public Service Commission, gas meters must be tested periodically to assure their reliability.

MFS changes out all positive displacement meters regardless of size for tests and repairs. Helping make this practice practical is the use of Victaulic connections with standard spread dimensions on meter sets . . . making all meters of a given size and type interchangeable with no pipe fitting required on a meter change.

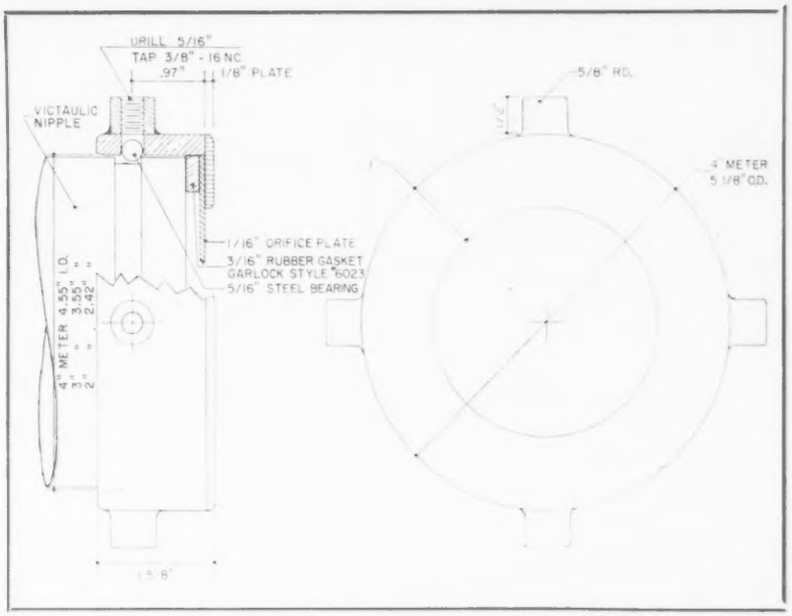
Shop testing means the meter can be tested under the most favorable conditions. There is no need to blow or vent gas on a customer's premises as with flow-type provers. Other variables — such as temperature, specific gravity, etc. — are either eliminated or controlled.

Maintenance and repair of large meters can be accomplished better in the shop, too, with all necessary tools and parts readily available. In fact, MFS no longer lubricates any meters in the field, as experience has shown that a meter can be run for a normal change interval without additional greasing. By lubricating the mechanism properly when the case is open, lubricant is put where it is needed and not on meter valves or into customers' equipment.

Testing Procedure

The testing procedure is to connect the meter with a bell prover through which a measured volume of air passes.

Smaller version of the "quick change orifice cap," shown in closeup, slides over outlet end of Victaulic connection, snaps in place.



Mountain Fuel Supply Company's quick change orifice cap.

The quantity of air registered by the meter dial is compared with the calibrated scale reading of the prover. Meters must be tested at both the rated capacity and a "check" rate that is 20% of capacity. Flow of air at these rates is regulated by using correctly-sized restricting orifice plates attached to the outlet connection of the meter.

Quick Change Needed

In the past, these orifice plates have been attached to large meters by bolting to the outlet connection a bulky Victaulic coupling device containing the orifice plate.

(Victaulic connections are made by butting together two pipes having identical shallow circumferential grooves spaced ⅝ in. from their ends. Butted ends are inserted in a hollow rubber sleeve which is enclosed by a two-piece bolted coupling which is tightened into the grooves of both pipes.)

The orifice plate was held in place by a pipe cap that screwed on the other end of the coupling device. To change on orifice plate, it was necessary to unscrew the cap, take out the old plate, insert the new, and screw the cap back in place. The entire operation of bolting the Victaulic coupling device in place and changing orifice plates by unscrewing and then rescrewing the cap seemed too time consuming. Surely there was a better and faster way this job could be done.

With this in mind, the writer, who is meter shop foreman at Mountain Fuel Supply Company, together with his assistant, Charles Cameron, began experimenting with various devices which we felt would speed up the testing procedure. We finally came up with a device that is so simple in design and operation it makes one wonder why it was never thought of before. Essentially, it is a cap that houses the orifice plate, slides on the outlet end of Victaulic connected meters, and snaps into place. With this new device, which we call a "quick change orifice cap," we can test a meter in the same time formerly required to make the initial hookup using the old coupling.

Easily Constructed

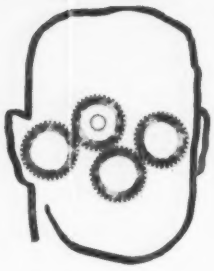
The quick change orifice caps we are using are not difficult to make. Moreover, caps can be made for any size connection. For example, we have made ours for use with 4, 3, 2, and 1½-in. pipe connections. Once we completed the design of the cap, the task of fabricating them was turned over to Robert Thompson, Mountain Fuel Supply Company garage mechanic, who did all the work in the company's machine shop. A lathe, a drill press, and a welding outfit are the equipment needed for the job. Materials include some standard pipe couplings of the same size pipe for which the cap is intended, some steel plate, steel balls, small springs, round steel stock, Allen set screws, and a rubber gasket.

The cylinder of the quick change orifice cap must have an inside diameter slightly larger than the pipe nipple it is to cover. We accomplished this by using a section of a standard pipe coupling 1⅝-in. long and turning out the threads. A ⅛-in. steel plate was then welded to one end of the cylinder and bored with a hole larger in diameter than any orifice plate to be used.

Around the circumference of the cylinder, three holes were bored equal distance from each other which are large enough for steel balls 5/16-in. in diameter to protrude through by ⅛-in. The holes are drilled at points which are approximately the same distance from the inner face of the gasket as the face of the Victaulic nipple is from the groove. The steel balls are mounted in spring-filled housings over the holes on the outer circumference of the cylinder with the ball protruding through the inner wall. An Allen set screw in the end of the housing permits the adjustment of the pressure on the ball exerted by the spring.

When the quick change orifice cap is slipped over a Victaulic nipple, the balls are readily depressed until the grooves are reached at which point the action of the springs forces the balls inward where they engage the shoulder of the groove and hold the cap in place. The grip is more than adequate in view of the small pressure involved in the meter proof test. A soft rubber gasket between the nipple and the orifice plate provides a tight inner seal. To change an orifice plate, all that is required is to slip off the cap, remove the gasket and orifice plate, insert the new orifice plate, and re-insert the gasket, then slip the cap back in place.

As mentioned previously, this is a simpler and a faster way of attaching the orifice plates to gas meters for testing purposes. The time saved by using this quick change orifice cap is considerable. * * *

Using the Gears  Between the Ears

LAY THAT SLIDE RULE DOWN!

Part 1

FUN WITH SQUARES

Prof. Paul J. Grogan, *Chairman*
Department of Engineering, University Extension Division
University of Wisconsin, Madison, Wisconsin

There is hardly anything more commonplace in our way of life than the infinite succession of integers, 1, 2, 3, . . . , 11, 12, 13, . . . , 21, 22, 23, ...

Yet, our Western civilization did not have this arithmetical notation in general use until about the time of Columbus. Thus, our most intelligent forefathers of seven life spans ago often labored tediously and all but vainly in solving problems easily mastered by a sixth-grade student of today.

We all understand how the integers follow endlessly, each a single unit greater in absolute value than its predecessor. We often do not understand, however, how easily the natural order of the simple integers may be made to do marvelous things for us if we handle them properly. For instance, by leaving out all even-number integers, we may establish the equally infinite sequence, 1, 3, 5, 7, . . . , 2n-1, ...

Then, by making a summation of the terms in the series, Table 1, we arrive at the squares of the integers. Along the first line of the table appear the first ten integers. The second line represents the first ten odd numbers. The third line values are found by performing a running addition of the odd numbers from the line above. These terms, uniquely enough, also represent the squares of the corresponding integers from the first row.

TABLE 1. Squares of Integers from 1 to 10 by Additive Processes.

n	1	2	3	4	5	6	7	8	9	10
2n−1	1	3	5	7	9	11	13	15	17	19
$\sum_1^n 2n-1 = n^2$	1	4	9	16	25	36	49	64	81	100

Therein lies the germ of an idea that suggests the origin of the calculus. Should we inquire, how does the function $y = x^2$ vary when $x = 5$?

By inspection of line three above, we see that y increases 9 units between 4 and 5, and increases 11 units between 5 and 6. Or, we may assume that y is changing an average 10 units per unit change of x.

Expressed in calculus, $y = x^2$, $dy/dx = 2x$; for $x = 5$, $dy/dx = 10$. Further inspection of Table 1 along line two shows that the "second difference" between the successive squares is simply 2, and it holds for the entire range of x. Expressed in calculus, $d^2y/dx^2 = 2$, a constant for all x.

How may the foregoing be put to work for us? We have merely chanced upon an **identity,** a mathematical tool that holds for the general case and may be applied therefore to any particular case.

Probably the most familiar identity in the experience of engineers is the example from trigonometry:

$$(\sin^2 x + \cos^2 x) = 1$$

There are a great many more which are equally well known and useful.

The one suggested in Table 1 may be established in many ways. The simplest method likely being

$$(x + 1)^2 = x^2 + 2x + 1$$

Thus we may proceed from 10^2 to 11^2 by the simple expedient of adding $(2x + 1)$, or 21, to 100. We recognize the square of 11 at once as being 121.

If we rewrite the identity used previously to read,

$$(x + 1)^2 = x^2 + x + (x + 1),$$

we may use the new form in more difficult assignments. The following is a demonstration of the prowess of this variation:

$$\begin{aligned} 91^2 &= 90^2 + 90 + 91 \\ &= 8{,}100 + 181 \\ &= 8{,}281. \end{aligned}$$

Similarly, we may use another identity,

$$(x - 1)^2 = x^2 - x - (x - 1).$$

Solving for 99^2 with the new relationship,

$$\begin{aligned} 99^2 &= 100^2 - 100 - 99 \\ &= 10{,}000 - 199 \\ &= 9{,}801. \end{aligned}$$

There are endless variations:

$$(x + 2)^2 = x^2 + 4x + 4$$

Therefore:

$$\begin{aligned} 102^2 &= (100 + 2)^2 \\ &= 10{,}000 + 400 + 4 \\ &= 10{,}404. \end{aligned}$$

And,

$$(x - 2)^2 = x^2 - 4x + 4$$

Therefore:

$$\begin{aligned} 98^2 &= (100 - 2)^2 \\ &= 10{,}000 - 400 + 4 \\ &= 9{,}604. \end{aligned}$$

Repeated application of a select few of the foregoing, and similar relationships, will develop new skills.

Another very useful identity deserves mentioning at this time.

$$(x + \tfrac{1}{2})^2 = x^2 + x + \tfrac{1}{4} = x(x + 1) + \tfrac{1}{4}$$

Thus,

$$1.5^2 = (1)\ (2) + \tfrac{1}{4} = 2.25$$

And,

$$7.5^2 = (7)\ (8) + \tfrac{1}{4} = 56.25$$

If we but imagine the immediately preceding example as applying to 75^2, then the answer will be just 100 times greater than the value obtained for 7.5^2.

Therefore,

$$75^2 = (7)\ (8)100 + 25 = 5{,}625$$
$$95^2 = (9)\ (10)100 + 25 = 9{,}025$$
$$205^2 = (20)\ (21)100 + 25 = 42{,}025.$$

Proceeding in another vein, if we investigate the successive squares of integers in the range from 20 to 30 some additional interesting properties are discovered. We realize already that the square of 25 is 49 units greater than the square of 24, and the square of 26 is 51 units greater than the square of 25. Hence, the square of 26 is 100 units greater than the square of 24. In Table 2, these various squares appear and their relationships to one another are indicated.

TABLE 2. Properties of Squares of Integers from 20 to 30

n−5	n−4	n−3	n−2	n−1	n	n+1	n+2	n+3	n+4	n+5
20	21	22	23	24	25	26	27	28	29	30
400				+ 500 =						900
	441			+ 400 =					841	
		484		+ 300 =				784		
			529	+ 200 =			729			
				576 + 100 =		676				
				625						

Thus the integers that are equally far removed from 25 have squares that differ by even hundreds. Furthermore, the number of hundreds difference corresponds to the number of units of the integers are removed from 25. Now, assuming all the squares up to 25 are known, one may find the square of any other integer from 26 through 75 by using an identity which we write as follows:

$$x^2 = (100)\ (x - 25) + (50 - x)^2$$

Hence,

$$38^2 = (100)\ (38 - 25) + (50 - 38)^2$$
$$= (100)\ (13) + (12)^2 = 1300 + 144$$
$$= 1444$$

And,

$$69^2 = (100)\ (69 - 25) + (50 - 69)^2$$
$$= (100)\ (44) + (-19)^2$$
$$= 4400 + 361$$
$$= 4761.$$

The Author

Paul J. Grogan was appointed Chairman of the University of Wisconsin Extension Division Department of Engineering in 1951 and served six years as Director of Engineering Institute in his departmental responsibilities. A Purdue graduate in Mechanical Engineering, with a master's degree from the University of Wisconsin, Prof. Grogan also attended war-time training programs at Pennsylvania State College and the University of Michigan. During World War II, he saw service in two tours of duty in the Pacific as a naval engineering officer.

Following World War II, Grogan taught four years in the University of Wisconsin College of Engineering and one year at the University of Notre Dame, where he directed the Internal Combustion Engine Laboratory and related research programs.

His industrial experience includes furnace and economizer design with the Wisconsin Electric Power Co.; natural gas conversion work for the Madison Gas and Electric Co.; power plant erection for the Babcock and Wilcox Co.; and power plant engineering consulting.

He is the author of some 35 articles that have appeared in American and foreign publications and has lectured extensively about the country on a variety of subjects. In his off-time, Prof. Grogan likes to devise mathematical shortcuts and to tinker with engineering oddities.

A similar, but less wieldy, identity may be written with 50 occupying the "pivot position" held by 25 in the example above:

$$x^2 = 200(x - 50) + (100 - x)^2$$

The range of application lies between 50 and 150, providing the first fifty squares are at hand. The existence of the identity may be established by expanding the right-hand side.

$$x^2 = 200x - 10{,}000 + 10{,}000 - 200x + x^2$$

A more advantageous method for finding squares of larger numbers is presented below:

$$(2x)^2 = 4(x)^2$$
$$(3x)^2 = 9(x)^2$$

Where a number is divisible by two or three, the square of the smaller number may be determined and multiplied by four or by nine, whichever is applicable. Multiplication by nine is most easily done by multiplying by ten first, and then subtracting the number from ten times itself.

Applying the previous method,

$$(144)^2 = 4(72)^2 = 9(48)^2$$

where either 48 or 72 may be squared by an earlier device. We may readily visualize,

$$48^2 = (48 - 25)100 + (50 - 48)^2$$
$$= (23)100 + 4 = 2304$$

And,

$$9(48)^2 = 23{,}040 - 2304 = 20{,}736.$$

The question might arise, "Why so much fuss about the squares of numbers?" But in defense, call on more and more identities, and use the squares of numbers to produce many other useful products.

For example,

$$(x + 1)\ (x - 1) = x^2 - 1$$

And,

$$17 \times 19 = 18^2 - 1 = 323$$

Or,

$$1.7 \times 19 = \frac{18^2 - 1}{10} = 32.3$$

Again,

$$(x + 2)\ (x - 2) = x^2 - 4$$

And,

$$17 \times 21 = 19^2 - 4 = 357$$

Be the master of the method, rather than letting the method be the master of you. Keep it flexible and fit it to each circumstance by calling upon the most useful application. After a time you will catch yourself using these methods to check answers obtained by conventional means.

A given identity may be useful in one sense one time and in the opposite sense the next. The last appearing examples are specific applications of the more general identity,

$$(a + b)\ (a - b) = (a^2 - b^2)$$

where we have been using b as a small integer. Writing the identity in the opposite sense,

$$(a^2 - b^2) = (a + b)\ (a - b),$$

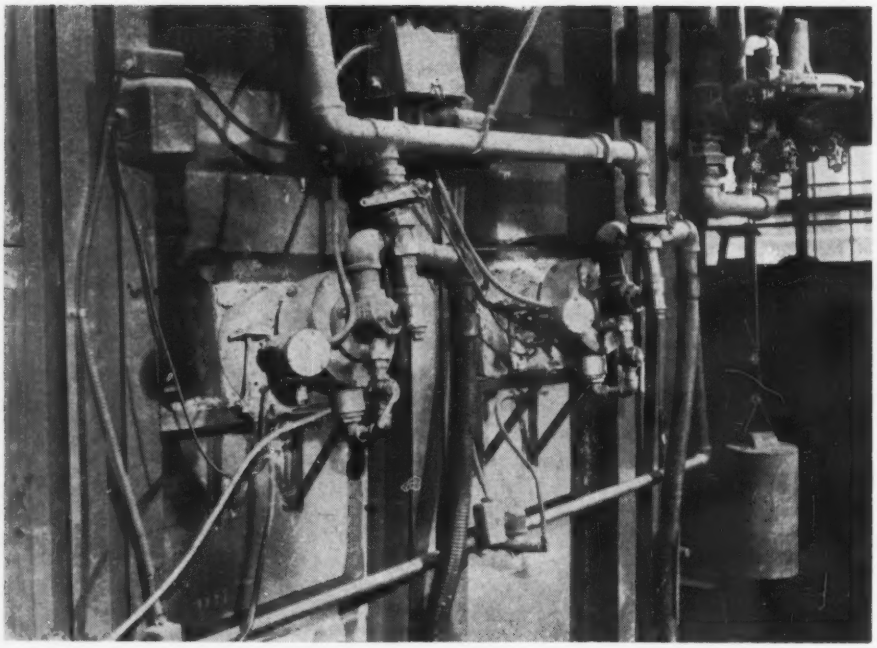
find the crank-end area of a 16-in. piston that has a 4-in. rod.

$$A = \pi \frac{(16 + 4)\ (16 - 4)}{4}$$
$$= \frac{\pi}{4}\ (20)\ (12)$$
$$= 60\ \pi \text{ sq. in.}$$

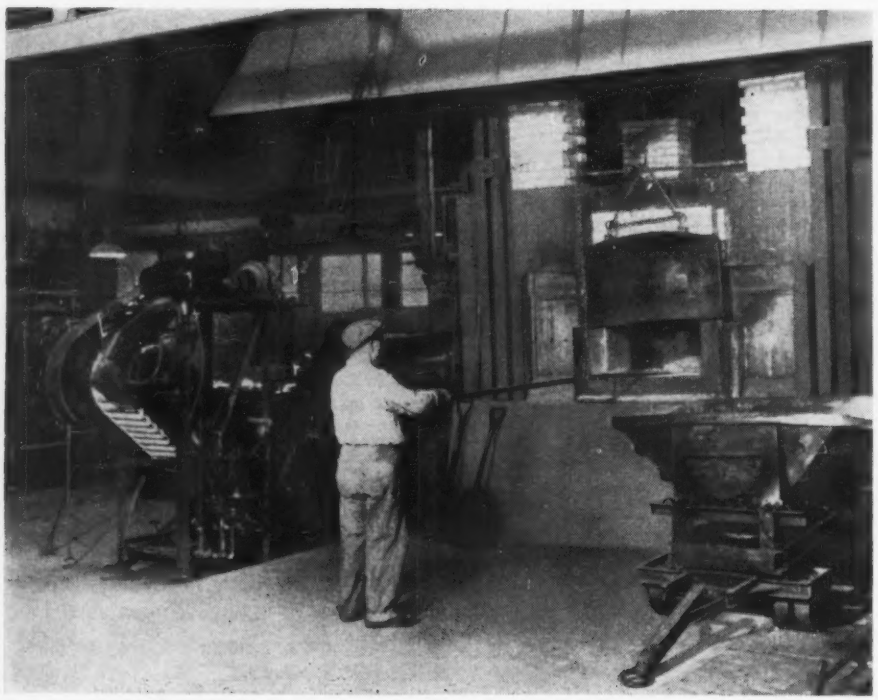
Or, find the net cross-sectional area of a pipe with a 12-in. outside diameter and a 10-in. inside diameter.

$$A = \pi \frac{(12 + 10)\ (12 - 10)}{4}$$
$$= \pi \frac{(22)\ (2)}{4}$$
$$= 11\ \pi \text{ sq. in.}$$

Foundry Cuts Fuel Costs Using Pulsating Gas Burners



Mounting of two burners on one reverberatory furnace at Hoover Company's North Canton, Ohio, plant is conventional except for lines which deliver 3 psi primary air.



Two 15,500-lb aluminum reverberatory furnaces supply aluminum pig used in the Hoover Company's die casting department. The furnaces are equipped with burners that operate on natural gas.

Use of a new type of pulsating gas burner in two 15,500-lb capacity aluminum reverberatory furnaces in the die casting foundry of The Hoover Company, North Canton, Ohio, has brought about dramatic savings in both gas and operating overhead, according to Ted McCoy, foundry foreman for the manufacturer of vacuum cleaners and other appliances.

The burners, manufactured by E. W. Bliss Company, use forced air at 3 psi and a special refractory liner to produce virtually perfect combustion of the natural gas used as fuel. Gas consumption at Hoover averages 1.3 cu ft per lb of aluminum melted from a fresh charge following a tapping.

One furnace operator can now handle both the new furnaces, as compared to two men on each of the older furnaces replaced with the units equipped with the new burners. This is the result of the efficiency of melting and the almost complete freedom from maintenance. Extreme cleanliness of the flame produced by the pulsating burners eliminates hydrocarbons, with a consequent increase in furnace refractory life.

Each furnace at Hoover is heated by two aspirator-type burners. During charging and melting, which takes 4½ to 5½ hours, the temperature is maintained at 1350 F. Tapping and pigging take from 2 to 2½ hours. Upwards of 6200 5-lb pigs are cast every day, for use in the foundry's die casting machines.

The flame produced by the new pulsating burner is a steady, extremely rapid series of explosions. The result is nearly perfect combustion of the air-fuel mixture. The flame is readily controlled by adjusting the air and the flow of fuel.

Temperatures needed at Hoover to melt aluminum are considerably below the maximum that the new burner can produce. In other industrial heating applications, it can generate flame temperatures above 3300 F with 1000 Btu natural gas. This is due to the burner's high heat release rate, 5,500,000 Btu per cu ft of combustion volume. Users have also reported fuel savings ranging from 12% to 30%. * * *

Another new development using

B.F.Goodrich Chemical *raw materials*

Now gas comes home through pipe of Geon

The pipe in this natural gas distribution system is made of Geon rigid vinyl. Years from now it will be feeding gas to homes just as efficiently as the day after installation. This pipe stays smooth inside and out because it is not affected by the corrosive influences that affect ordinary pipe. No problems from salt water, chemicals, acid or alkaline soils, or galvanic corrosion.

Conduit or pipe made of Geon provides high tensile and impact strength. It stands up under pressure, resisting effects of fungi, bacteria, moisture, heat or cold. It makes a big hit with installation crews, since it is so light weight and so easy to install.

Engineers are taking advantage of the properties of versatile Geon polyvinyl material for this and many other types of applications. For information, write Dept. NM-1, B. F. Goodrich Chemical Company, 3135 Euclid Ave., Cleveland 15, Ohio. Cable address: Goodchemco. In Canada: Kitchener, Ontario.

1¼" diameter pipe of Geon rigid vinyl is being installed by Illinois Power Company in gas lines leading to homes at Decatur, Illinois. In addition, ¾" vinyl pipe is being inserted in reamed-out 1¼" iron pipe under streets to avoid breaking the pavement to repair leaking gas lines. Kraloy Plastic Pipe Company, Los Angeles, California, makes the pipe. B.F.Goodrich Chemical Company supplies the Geon rigid vinyl.

Geon VINYLS

B.F.Goodrich Chemical Company
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GEON vinyls • HYCAR rubber and latex • GOOD-RITE chemicals and plasticizers

MUSCLE, FOR MILES AND MILES

Ruggedness. That's the inherent feature in cast iron pipe. The ability to provide trouble-free service for years; the "muscle" to withstand all the usual stresses to which underground pipe is normally subjected.

DEPENDABILITY, FOR YEARS AND YEARS

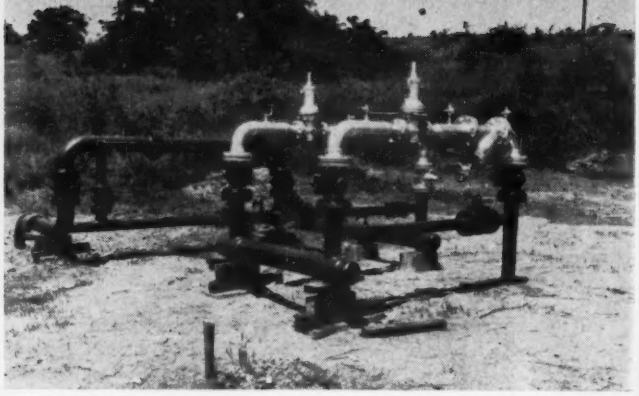
Cast iron pipe rarely needs attention; today 63 American gas utilities still use cast iron gas mains that were installed over a century ago. And modern cast iron pipe, with bottle-tight mechanical joints, offers the same promise of lengthy service. Muscle and dependability—they add up to real savings over the years!

CAST IRON PIPE RESEARCH ASSOCIATION,
Thos. F. Wolfe, Managing Director,
3440 Prudential Plaza, Chicago 1, Illinois

CAST IRON PIPE

THE MARK OF THE 100-YEAR PIPE

Welders George Scheiring and Fred Buffalini line up clamp prior to welding two sections of pipe as foreman Andy Marflak watches. Entire line was mill coated-and-wrapped and welded.



Regulator installation on Hilltop Ridge line is located about one-fourth mile from the "perimeter line." Regulator building to house installation was added later.

Gas Goes to the 'Missile Master'

Natural gas is playing a vital role in the defense against air attack in the Pittsburgh, Pennsylvania area. High on a ridge in Collier Township, near Pittsburgh, a cluster of giant radar domes has blossomed from the otherwise serene landscape. The huge bubbles are the eyes and ears of a complex nerve center known as *Missile Master,* a complete electronic system for the coordination and direction of 12 Nike guided missile firing batteries that ring the area.

Simultaneous with construction of the many units of the *Missile Master* installation, Equitable Gas Company crews have been busy laying a gas line from the company's "perimeter" loop line for a distance of about three miles along Hilltop Ridge to provide gas service to the nerve center.

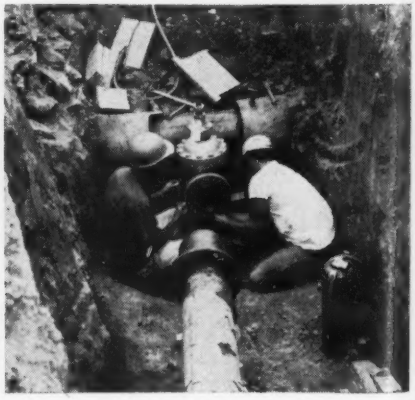
Hub of the *Missile Master* installation is the "Blue Room," where sensitive radar and electronic equipment gathers, evaluates, and plots information on potential attackers. Here, too, would originate the command for the Nike batteries to open fire . . . but only the various Nike battery commanders could actually "pull the trigger."

Because dust can be a hazard to the delicate electronic equipment, all air is carefully filtered . . . and the filtered air is warmed by natural gas. A gas-fueled boiler plant will also heat other units of the installation as well as supply hot water. The central kitchen will have the finest, most up-to-date gas equipment.

In addition to the Missile Master installation, Equitable also supplies gas service for eight Nike battery sites in its area. * * *

Construction crews of Equitable Gas Company's Division "A" cut their way through a limestone outcrop along Hilltop Ridge while laying a 3-mile, 6-in. gas line to serve the Missile Master air defense installation in the background at left of photo. Crew is using air compressor to break up the rock for removal.

Tapping machine for making a "hot tap" (under pressure) connection to the "perimeter line" is guided into place by Harold Kunkler of Equitable's bridge crew.



Full-opening 6-in. valve is installed and flange checked prior to attaching the tapping machine for the "hot tap" by Al Lawson and F. Lapacik. In background is exposed section of the 16-in. "perimeter line" and the 20-in. casing protecting it near roadway crossing.

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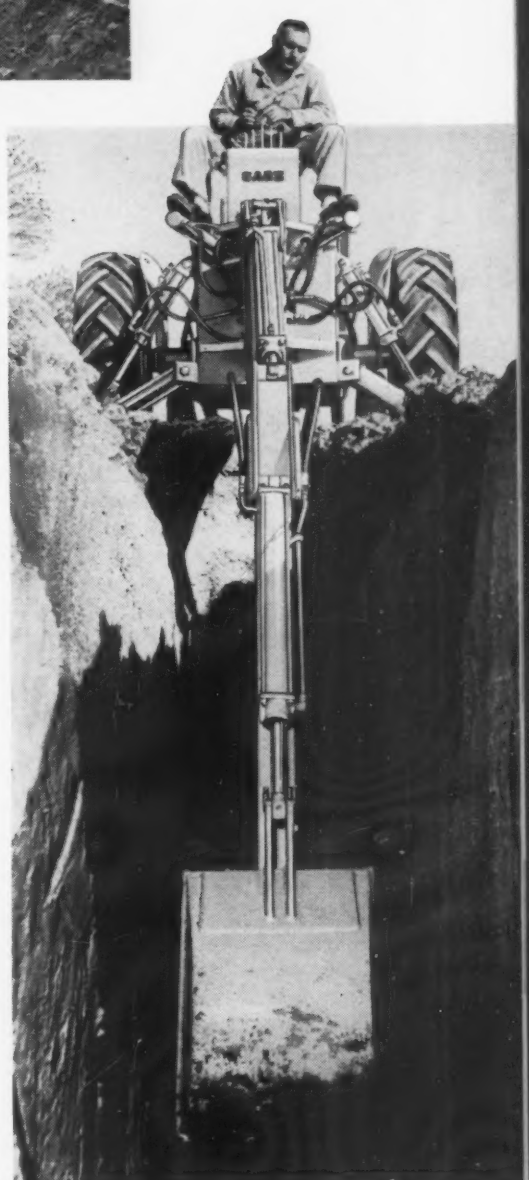
LOADING • CARRYING



Now...get a 14′ digger at 12′ price in a CASE® 530 *Utility* Backhoe-Loader

Why settle for a limited-duty 12′ digger, sacrifice trench production too, when the same investment will get you a heavy-duty J. I. Case 530 14′ Backhoe and rugged 2000-lb. loader? This digging-loading specialist saves you over $1500 in first costs over other 14′ diggers . . . and continues those big savings in extra capacity, low operating and maintenance costs throughout its long productive life.

Mobile production machine

Case 530 Backhoe-Loader travels anywhere at speeds up to 18 mph to quickly handle your trenching and clean-up assignments. It cuts trench 14′ deep . . . reaches and digs 16′9″ from pivot . . . loads any size truck . . . swings 180° with foot-pedal hydraulic control for fast cycling. 2000-lb. front end loader applies 3700-lb. breakaway, dumps with over 9′ clearance for quick dump-and-go. It's a rugged machine with highest quality features, including patented swing system, alloy-steel backhoe boom, dipper stick and buckets, plus power steering, shuttle transmission, 14.9-24 tires and long-life features.

Save on shallower trenching

If your excavations do not exceed 10′ depth, you can cut your investment even more with the economy Case 430 *Utility* Backhoe equipped with either front counterweight, or 1000-lb. or 1200-lb. loader. Optional quick-change pallet fork, crane boom, and dozer blade available with all loader models.

Ask for a demonstration

Call your Case *Utility* Dealer for a free demonstration on one of your current jobs. Send coupon for full details.

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Send complete details on diggers: ☐ 14′ ☐ 10′ CU-BL-253

Name .....

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Thousands of Arizona Public Service Company's natural gas customers in the fast-growing north Phoenix area were recently provided an alternate source of fuel when the utility completed a 6-mile high pressure feeder gas main. Above, crews of the Desert Pipe and Construction Co. of Phoenix, contractor for the job, install a 40-ft section of the pipe on the south side of Northern Avenue between 27th and 75th Avenues. The new 12-in. line represents the largest gas feeder construction project in the Phoenix area since 1955. Besides providing existing customers with an alternate gas source, the new line will provide gas for the tremendous future growth projected for the area.

Distribution Developments

NEWS ABOUT CURRENT AND PLANNED CONSTRUCTION

Northern Indiana Public Service Company, Hammond, Indiana, plans to spend approximately $1,250,000 to provide gas service to approximately 2400 additional rural customers in 14 counties in the northern third of the state of Indiana. Included are rural areas in Porter, La Porte, Starke, Marshall, Pulaski, White, Newton, and Benton counties; Cass County except Deer Creek, Jackson, and Clinton townships; Wabash County except Waltz and Liberty townships; Carpenter township in Jasper County; Jefferson township in Carroll County; Bloomfield and Clay townships in LaGrange County; and Perry and Sparta townships in Noble County.

Southern Union Gas Company, Dallas, Texas, has completed a 535 ft 2-in. main extension in Artesia, New Mexico, to serve two new businesses south of town. Both businesses, Jackson's Restaurant and the West Winds Motel, will use large gas air-conditioning units. In another project, two miles of distribution main were installed along Animas Valley north of Durango, New Mexico, to add approximately 60 residential and commercial customers to the Durango system.

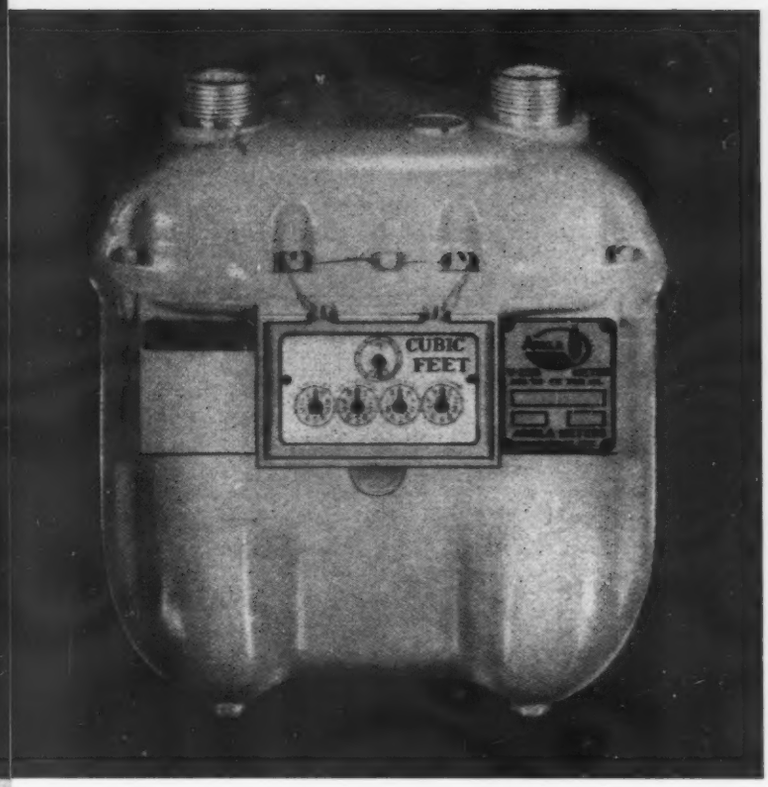
Iowa Public Service Company, Sioux City, Iowa, has completed distribution systems in Evansdale, Elk Run Heights, Raymond, Washburn, Gilbertsville, Janesville, and Jesup in the Waterloo Iowa, area, and in Goldfield, near Eagle Grove at a cost of approximately $700,000. (Original budget, see *June AGJ*, was set at $660,000.) Supplier is Northern Natural Gas Co.

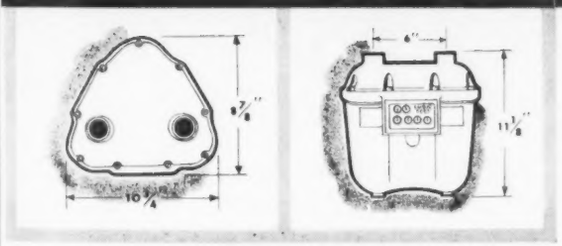
Cincinnati Gas & Electric Company, Cincinnati, Ohio, has obtained gas franchises to initiate service in the villages of Blanchester and Carlisle. Installation of mains to initiate service to the villages of Mason, Millville, Terrace Park, Milford, Cleves, and North Bend, all within CG&E's service area, have been completed and gas service is being supplied. Service to Millville, Ohio, was begun in November with completion of 10 miles of main and a metering-regulation station.

Wisconsin Public Service Corporation, Milwaukee, Wisconsin, has changed plans for Oconto as a result of "booming demand for natural gas." The previously-budgeted $276,000 for new facilities has now been boosted with Public Service Commission approval to $448,000. Also, the budget for natural gas facilities in Marinette, Peshtigo, Stevens Point, Park Ridge, and Whiting has been upped to $1,346,000.

Northern Illinois Gas Company, Aurora, Illinois, officially turned on gas in its 301st community—Troy Grove—November 15. Franchise ordinances recently obtained by NI-Gas include new 50-year ordinances from Crescent City, Lynwood, and Oakwood Hills. Negotiations are continuing with Watseka City officials for purchase of the community's municipal gas system and passage of a similar 50-year franchise ordinance. NI-Gas has offered to serve both Crescent City and Watseka from a pipeline to be extended to the company's proposed underground storage site near Crescent City located in mid-Iroquois County, approximately 25 miles south of Kankakee. Search for more underground storage reservoirs continues with efforts currently being concentrated in the Champaign and Rantoul area; wells are now being drilled to 300 and 650 ft depths to investigate the rock formations.

THE ARKLA V 250 GAS METER





Dimensions: The Arkla V250 Gas Meter weighs less and is smaller than any other 250 cu. ft./hr. gas meter.

A NEW, COMPACT, ACCURATE "CASH REGISTER" FOR THE GAS INDUSTRY!

EXCELLENT ENGINEERING AND DESIGN of this gas meter, first of a new, modern line, are evident in its light weight and compactness that make the Arkla V250 Gas Meter easy to install . . . fewer moving parts reduce maintenance . . . accuracy of the Arkla V250 Gas Meter makes it a welcome "cash register" for the gas industry.

Order ARKLA V250 GAS METERS TODAY. *(Other models available soon.) For further information, write or call us, or ask your Arkla-Reynolds Gas Regulator representative.*

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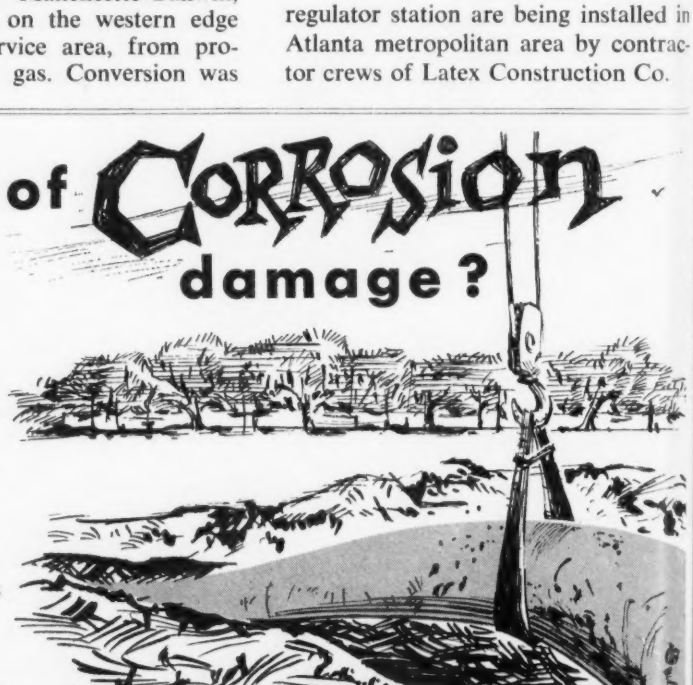
A Division of Arkla Air Conditioning Corporation

Natural Gas for Ada, Michigan. Contractor crews of Somerville Construction Co. use crawler-tractor with hydraulic sideboom to help lay nearly 2000 ft of 6-in. pipe a day in a construction project for Michigan Consolidated Gas Company. Ada will be supplied natural gas from Mich-Con's Grand Rapids station approximately 20 miles away.

Laclede Gas Company, St. Louis, Missouri, plans to extend its Lindbergh belt line 5 miles from Highway 40 to Lackland Road, completing a feeder-pressure loop from Lansdowne Road in the central county, all the way to Brown Road in the north county. Completion of this project will improve performance of the system and make it easier for the company to attach additional gas loads more quickly whenever the necessary additional gas is obtained. In another project, company crews are currently converting first of 150 homes in Manchester-Ballwin, Missouri, areas on the western edge of Laclede's service area, from propane to natural gas. Conversion was ahead of schedule as a result of early completion of a new 6-mile extension of Laclede's feeder pressure system westward from Lindbergh along Manchester Road *(AGJ Dec. 60)*. Only a minimum number of changes were necessary in the conversion — meters, regulator springs, and enlargement of appliance orifices — because lines and meters through which householders have been receiving propane gas from an independent dealer of propane gas were constructed to Laclede specifications under a previous agreement with the builders, and the dealer. As part of the arrangement, Laclede had agreed that when practical it would tie these lines into its system.

Atlanta Gas Light Company, Atlanta, Georgia, has extended its mains to serve the new 269-unit Ansley Forest Apartments on Piedmont Avenue in Ansley Park area in Atlanta. Gas will be used for space heating, water heating, air conditioning, cooking, heating the swimming pool, and outdoor lighting; project is expected to use approximately 39,400,000 cu ft of gas yearly. In another project, approximately 5000 ft of 12 and 16-in. main and a new regulator station are being installed in Atlanta metropolitan area by contractor crews of Latex Construction Co.

feeling the effects of CORROSION damage?



Midwestern's Keystone Keybestos Felt is one sure way to better protect your pipelines from costly failures due to corrosion damage. Keybestos provides a tough, durable wrapping with high impact resistance and positive protection against soil acids. The material is sufficiently perforated to allow troublesome trapped gases and air to escape and thus prevent costly holidays in the coating. Keybestos applies at high speeds with little danger of breakage due to its parallel reinforcement. It is available in widths of 2″-36″ . . . lengths of 50′-2000′ . . . and weights of 8 and 15 lbs.

For better, more permanent wrapping of your next pipeline, ask a Midwestern Man to demonstrate the advantages of Keybestos Felt. Contact one of the nine strategically located Midwestern offices shown at the right.

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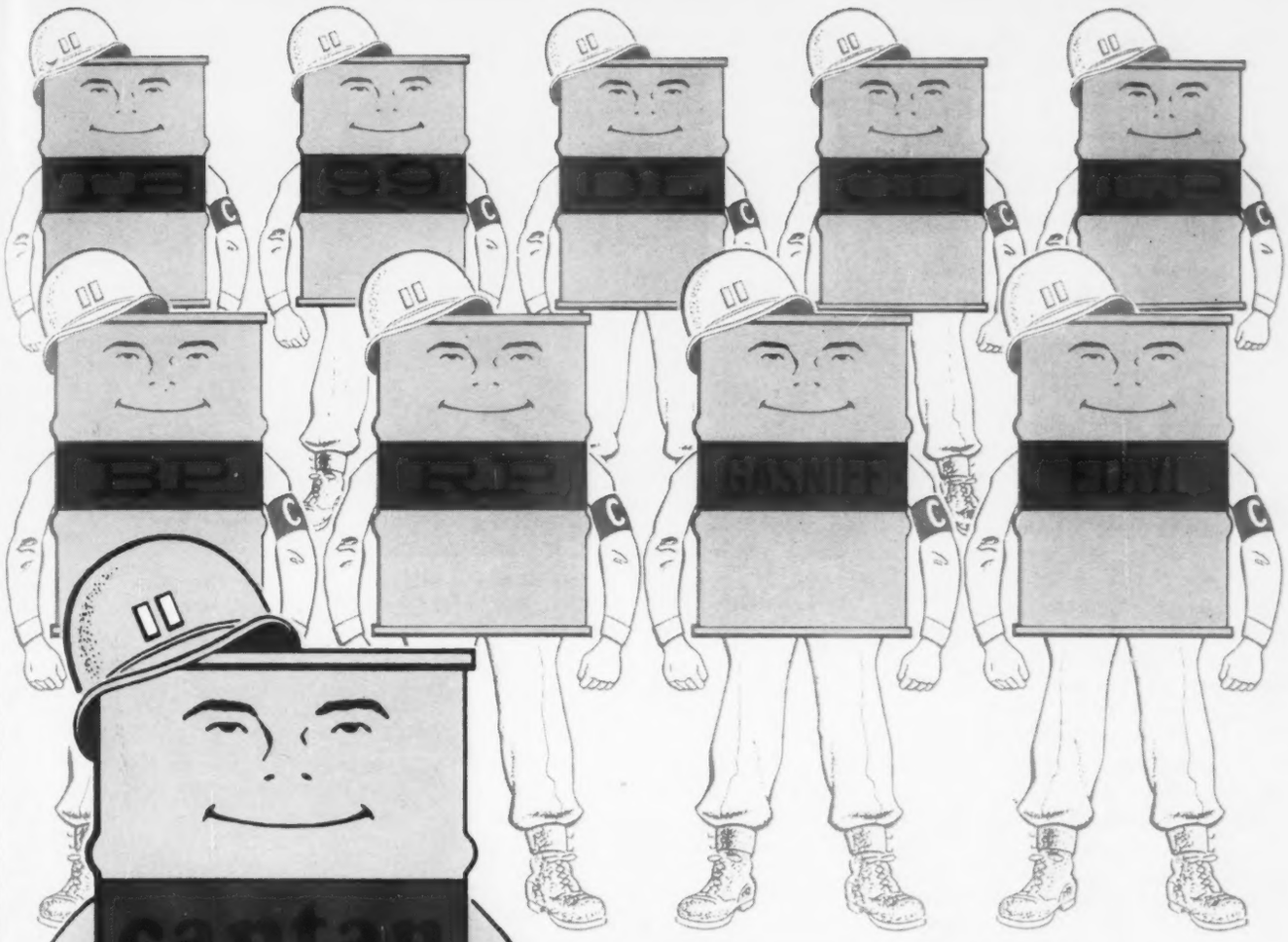

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CAPTAN commands more GUARDS than anyone else in gas odorization.

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NATURAL GAS ODORIZING, INC.

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60-6

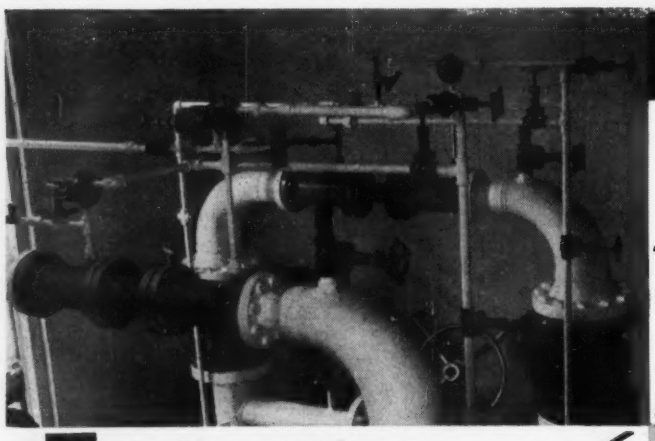
Distribution Developments

Iowa Electric Light and Power Company, Cedar Rapids, Iowa, will add approximately 5000 new gas customers with completion of its 1960 construction program of new gas distribution systems in 14 Iowa towns. Crews, currently in Toledo and Garwin are installing service lines and connecting customers; work is in progress at Wellsburg, and service lines are being installed at Hazelton and Garrison. Conversion from LP-air gas at Vinton has been completed, and crews are constructing additional facilities. At Oelwein conversion from manufactured water-gas has been completed — marking the end of the manufactured water-gas era in the Midwest—and natural gas has been turned into the distribution system. In Dysart, Toledo, and Tama customer service is being installed. Although service installations were completed at Gladbrook early in the season, no gas was available until the pipeline company completed its work on the main feeder line.

Two new 6-in. by 18-in. rotary meters installed at the H. J. Heinz plant in Muscatine, Iowa, by Iowa Electric Light and Power Co., handle measurement chores where a high differential load exists during the working day. Maximum load when the plant's three boilers are going is 148 Mcf per hour. Minimum load — one boiler — is 15Mcf. Meters are manifolded together, and can be used separately or jointly. Manual changeover from one meter to two is used because plant always has fireman on duty. Checking installation are IEL&P district manager H. P. Ives and operating superintendent Ray Noret.

United Petroleum Gas Company, Minneapolis, Minnesota, initiated natural gas service for the first time to Detroit Lakes and Ada, Minnesota, late in November. Plans for expansion include installations of natural gas distribution systems in 9 additional communities in the north central states during the next 3 years. United Petroleum, a new natural gas distributor, is the wholly-owned subsidiary of Diversa, Inc. of Dallas, Texas. UPG also markets LP-gas in Minnesota, Wisconsin, the Dakotas, Arkansas, and Texas.

Southeastern Michigan Gas Company, Port Huron, Michigan, is installing approximately 5 miles of 6-in., and 1 mile of 10-in. mains in the VanDyke, Michigan, area. Contractor is H. L. Gentry Construction Co. of Perrysburg, Ohio.



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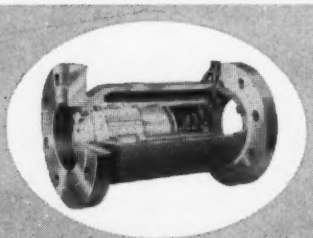
Use it anywhere a gas valve is needed!

An excellent control valve for town border, industrial, monitor and relief valve application for Psi to Psi gas regulation . . . Also as on-off control for process gas safety.

Compact cylindrical shape makes the new Reynolds Slide Valve Regulator easy to install horizontally or vertically, below or above ground.

Sizes, 2", 4", 8", others planned. Range: Max. inlet pressure 1,200 Psi.

Above: Reynolds Slide Valves reduce pipeline gas pressure for a Muncie, Ind., industrial system.



Parts are made of hard chrome-faced steel to protect against corrosion and wear. Simply remove one retaining ring to disassemble.

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With Clevelands • • • just like the rest of the U.S.A.

As natural gas spreads through Alaska, the same modern high production equipment used in the rest of the U.S.A. is speeding construction of facilities. Cheney Construction Co., for example, is using this Cleveland J-20 to cut miles of trench for the distribution system in Anchorage.

Cheney believes in employing the most modern equipment. And the J-20 is surely that. At his seat, Cheney's operator has 100% control of every J-20 operation—conveyor shifting, spoil discharge speed and direction, crawler speeds, steering, boom hoist and digging wheel speeds. In close quarters the Cleveland J-20 maneuvers quickly and easily, sneaks by trees and poles, cuts trench as close as 18 inches from side obstructions. It digs to precise grade and width requirements . . . discharges fined spoil where wanted for low-cost backfilling . . . delivers high daily production on services as well as mains.

THERE'S NOTHING LIKE THE CLEVELAND J-20 FOR DISTRIBUTION TRENCHING

- ONLY 60" WIDE OVER ITS CRAWLERS.
- DIGS 12" TO 24" WIDE, TO 5½' DEEP.
- 4 FORWARD WHEEL SPEEDS PLUS REVERSE.
- 33 POSITIVE, NON-SLIPPING DIGGING SPEEDS.
- *ALL* SPEEDS IN BOTH DIRECTIONS.
- WORLD'S FINEST TRENCHER CRAWLERS.
- 1,000-HOUR TRACK LUBRICATION.
- FULL-RANGE BOOM HOIST.
- HYDRAULICALLY SHIFTED CONVEYOR.
- PULLEY-ENCLOSED DUAL CONVEYOR DRIVE.
- OPERATOR CONTROLS DISCHARGE SPEED AND DIRECTION.
- 330 CU. IN. ENGINE, 50 HP @ ONLY 1200 RPM.
- HYDRAULIC-LIFT CRUMBING SHOE, OPTIONAL.
- 100% CONTROL AT OPERATOR LOCATION.

IF DISTRIBUTION'S YOUR JOB,
THE J-20 IS THE TRENCHER FOR YOU.

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SAVE MONEY

no meter set and removal expenses

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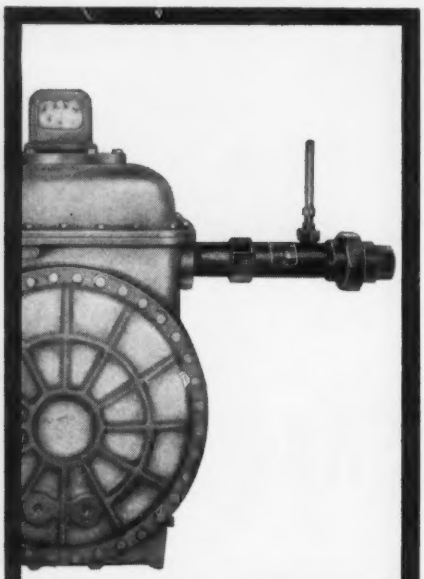

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AMERICAN LOW PRESSURE FLOW PROVERS for testing meters with air or gas at pressures below 15 psi. Calibrated orifice discs for capacities ranging from 100 to 10,000 cfh.

AMERICAN CRITICAL FLOW PROVERS for testing high pressure displacement meters. 1000 psi maximum working pressure. Available in 2-inch size with gas capacities from 250 to 6000 cfh.

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Distribution Developments

Ohio Fuel Gas Company, Columbus, Ohio, completed distribution construction projects totalling $989,000 during November and December. **Burkhardt Construction Co.** of Avon Lake, contractors, installed a $22,450 2 mile 4-in. line along Hayes Ave. and part of Wade Blvd. south of Sandusky,

Central Pipelines Co. of Lima installed 9.5 miles of 12¾-in. line between Fredericksburg, Wayne county, and Malvern, Carroll county, to replace 8 sections of 3 existing connected O-F lines that deliver gas to Alliance, Salem, and Waynesburg. Project was estimated to cost $414,000. Contractor also installed a $70,150 main extension project to extend natural gas service to the Whitacre-Greer Fireproofing Co. near Magnolia. Project involved approximately 2.5 miles of 6⅝-in. line south from an existing O-F line near Big Sandy Creek, northeast of Magnolia, to Whitacre-Greer plant southeast of town.

Kenneth G. Myers, Green Springs, contractor, installed more than a mile of 1¼-in. line east along Route 18 to extend gas service to Bairdstown at an estimated cost of $12,400.

Don Miller, Inc. Green Springs contractor, installed 9800 ft of new lines — 2, 4, 6 and 8-in. — to extend gas service to Pine Hills Addition southeast of Columbus in a $36,700 construction project. Line extends south along Noe-Bixby Rd. from near York Lane North, to near York Lane South, then across country to Livingston Ave. A new regulator station is to be built at Livingston Ave.-Woodcrest Rd. intersection and new lines extended south along Woodcrest Road to Brinwood Court. Contractor also has a $94,300 construction-conversion project to improve natural gas service in northeast Columbus and Linden areas. Approximately 2 miles of 6 and 10-in. line were laid and new regulator equipment installed at 6 existing regulator stations. One section of 10-in. line extends 500 ft east to an existing line at Cleveland Ave. from existing line north of Jordan Rd. A second section of 10-in. line, 8400 ft long, parallels first section east to Cleveland then extends south along Cleveland to existing line at Morse Rd. Third new section, 300 ft of 6-in., extends east from existing line north of Lemner Road to existing line at Cleveland Ave. New regulating equipment is being added at existing regulator stations north of Jordan Rd., north of Lemner Rd., south of Sale Rd., and at Huy Rd., Weldon Ave. and Milford Ave. New construction establishes tie-in between major 20-in. supply line north of Jordan Road and 18-in. supply line at Weber Rd.

Contractor crews of **Ohio Pipeline Construction Co.** of Newark, have completed a $55,000 project to extend service to Winchester subdivision on Route 33 southeast of Columbus. Two miles of 2 to 6-in. extends east along Refugee Rd. from an existing O-F line to Route 33, south along Route 33 to the new subdivision, and along Hampton Rd. and Wessex Court in the subdivision. Contractor has also completed construction projects totaling $23,500 to improve gas service in Marysville. New regulator station was constructed on Hickory Drive and almost a mile of 3 and 4-in. line installed to tie-in new station with O-F's pipeline system. New lines extend west along Collins Ave. from existing line at Mullberry St. to Grove St. north on Grove to grade school and west to new regulator station. More than 1000 ft of 8-in. was also replaced along Fourth St. between Walnut and Court streets.

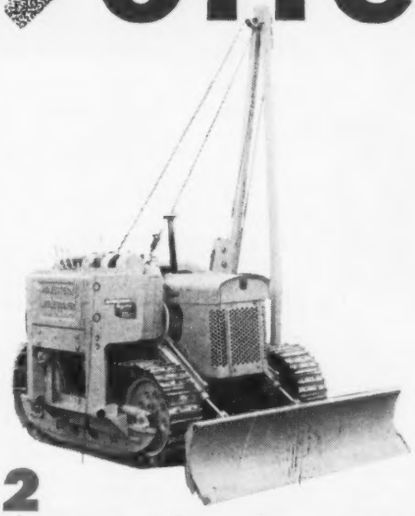
George L. Ramsey, Lisbon contractor, completed a $26,500 construction project in Salem that includes a town border station at Indiana Blvd.-State Route 62 intersection on the west side of town, and 245 ft of new 6 and 8-in. line that ties-in the new station.

Wirt & Starn, Inc. of Wooster replaced more than 2 miles of 8⅝ in. line south of Vermillion corporation line to increase gas service to Vermillion at a cost of $85,000.

In another project, O-F has completed projects involving almost 10 miles of line and costing an estimated $149,000 to extend gas service to villages of Clay Center and Millbury, north and northwest of Genoa. **Wirt and Starn** laid the line in the two cities; **Don Miller Inc.** of Green Springs laid the line connecting the two villages.

"You can't buy them, my wife knitted this one for me."

now MIDWESTERN offers you



the 2 greatest names in compact sidebooms

LITTLE BOOMER
for Crawler Type Tractors

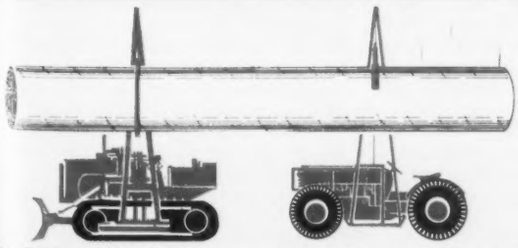
Little Boomer gives excellent maneuverability and maximum traction for jobs where the advantages of a crawler tractor are required.
Lifting capacities range from 5,000-16,000 pounds. Ideal for laying small to medium diameter pipe in cities or in the field.
Simplified hydraulic controls make operation easy, fast . . . give positive control at all times. Double drum winch arrangement places both winches in full view of the operator at all times.

SOONER BOOMER
for Rubber Tired Tractors

Sooner Boomer is ideal unit for city distribution work where rubber tires eliminate damage to streets and yards. Wheel operation increases on-the-job mobility . . . does not require truck transportation for short hauls between adjacent jobs. Hydraulic controls make pipe handling easy, fast, economical.

ATTACHMENTS
Other Midwestern attachments designed to increase the versatility of the Little Boomer and Sooner Boomer include Angle Dozers, Tail End Winches and Bending Shoes.

APPLICATIONS
Midwestern Sidebooms are designed for mounting on Ford, Case, International Harvester, Allis-Chalmers, John Deere, Oliver and Caterpillar D4 tractors. Midwestern sidebooms may also be mounted on one to three cubic yard loaders. Midwestern sidebooms are "Pipeliner" tough . . . built to withstand the most rugged field conditions. They give low initial cost . . . low operating cost . . . low maintenance cost. Investigate the advantages of Midwestern Sidebooms today! Widely used by pipeline contractors and utility companies.



LITTLE BOOMER • SOONER BOOMER

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MANUFACTURING COMPANY
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★ Designed to fit your standard drilling or stopping equipment.

★ Reducing discs available for extending 1½″, 1¼″ and 1″ mains, thereby standardizing drilling and stopping equipment.

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Product Parade

MATERIALS • EQUIPMENT • SERVICES

Weight computations for welded steel tubing are easily obtained from tables in new brochure from Electricweld Tube Div. of Jones & Laughlin Steel Corp. Tables in handy 16-page brochure give dimensions, weight per foot for round mechanical tubing up to 10 in. square. Full-page table gives diameters and weights for pipe sizes (plain ends).

CIRCLE (1) ON THE REPLY CARD

Desk-top 2-way radio base station . . . designed for operation in the 25-54 mc frequency band . . . is now available from Motorola, Inc. Unit weighs under 40 lb, is only 15 inches long, 18 inches wide, and less than 9 inches high. Can be used to communicate with vehicles in plants or away from the office, with persons carrying Motorola "handie-Talkie" portable radiophones, or with personal radio paging system. Provides 25 watts power output on systems operating on high band (144-174 mc) frequencies, and 30 watts on low band (25-54 mc) frequencies. Utilizes 300-watt transmitter, making it the highest powered unit in Motorola's standard line.

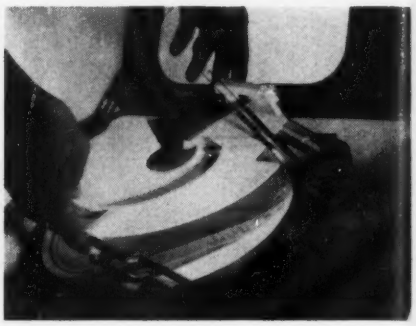
CIRCLE (2) ON THE REPLY CARD

New compact aluminumcase meter . . . with ample capacity for small industrial or commercial loads . . . has been added to American Meter's line of light weight meters. Incorporates same design used throughout American's line of positive displacement meters, including D-slide valve construction and bellows-type molded duramic diaphragms. Meter weighs 18 lb and operates at only 5 revolutions per cu ft. Has a rated capacity of 425 cfh at ½-in. w.c. differential with 0.64 sp. gr. gas. Maximum working pressure is 10 psi.

CIRCLE (3) ON THE REPLY CARD

Single-case time-program recorder-controller . . . now available from the Bristol Co. . . . incorporates recorder and controller into single unit and affords 50% reduction in panel-space requirements. Recorder chart and program cam are independently driven, making it possible to record repetitions of the program on a single chart. Program time may be from 30 minutes to 30 days. Various models are available to measure and control temperature, pressure, flow, liquid level, and humidity. Either pneumatic control or electronic control are available.

CIRCLE (4) ON THE REPLY CARD



Automatic chart changer . . . for circular chart recorders . . . is now available from Barton Instrument Corp. New unit makes it possible to operate a recorder unattended for up to 16 days using a new 24-hour chart for each day. Changer consists of chart plate that holds charts, and chart scroll that moves used chart out of the way of succeeding one without interrupting recording sequence. Unit is available as integral part of Barton model 202A recorder or in kit form to fit Barton 202 recorder, Bristol series 500, and the American types D and A cases.

CIRCLE (5) ON THE REPLY CARD

Safe, modern methods of gas vent installation, second in the series, is now available from the Gas Vent Institute. New bulletin covers advantages of using Type B double wall metal vents in place of Type C single wall pipe for vent connectors. It supplements first bulletin that outlined theory of venting and principles of double wall gas vent operation. Bulletins are available to local code officials and utility company executives.

CIRCLE (6) ON THE REPLY CARD

New stump cutter shreds stumps in minutes, can handle any size stump up to 33 inches in height. Digs out stumps down to 15-in. below surface. Entire cutting operation is controlled by one man using 3 levers that regulate side-to-side motion of cutting wheel, height of frame, and horizontal motion of the frame. Unit weighs only 3030 lb, takes hydraulic power and operating power from any tractor with standard PTO up to 65 belt hp. Trails easily behind tractor, truck or jeep.

CIRCLE (7) ON THE REPLY CARD

Split-second electronic detection of flame-out, and immediate shut-down of industrial and commercial combustion facilities is now possible with new electronic combustion programming control developed by General Controls. System features a midge ultraviolet detector tube that "sees" and reacts almost instantaneously to presence or absence of flame only. Cited as a highly reliable flame-out detector . . . unit responds only to ultraviolet rays in wave lengths shorter than visible light, is not sensitive to variations in fire box heat or normal background radiation.

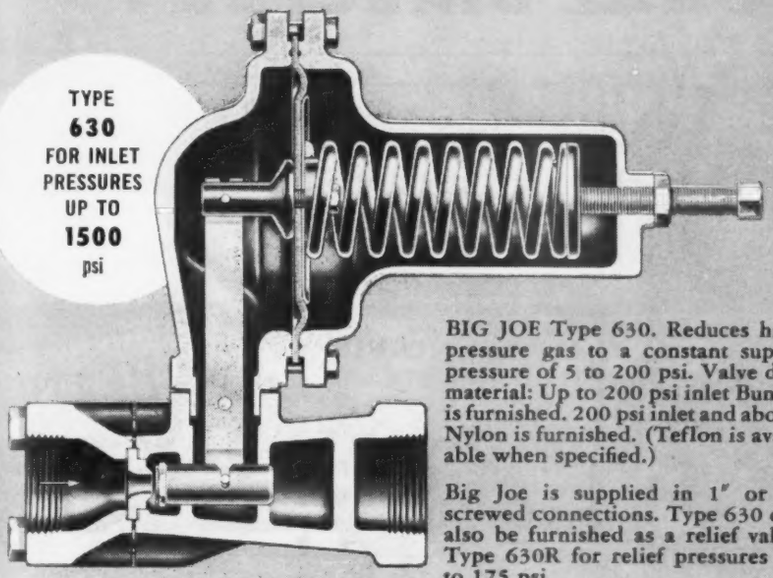
CIRCLE (8) ON THE REPLY CARD

Your *FISHER/MAN* Brings You

FISHER PRESSURE REGULATORS

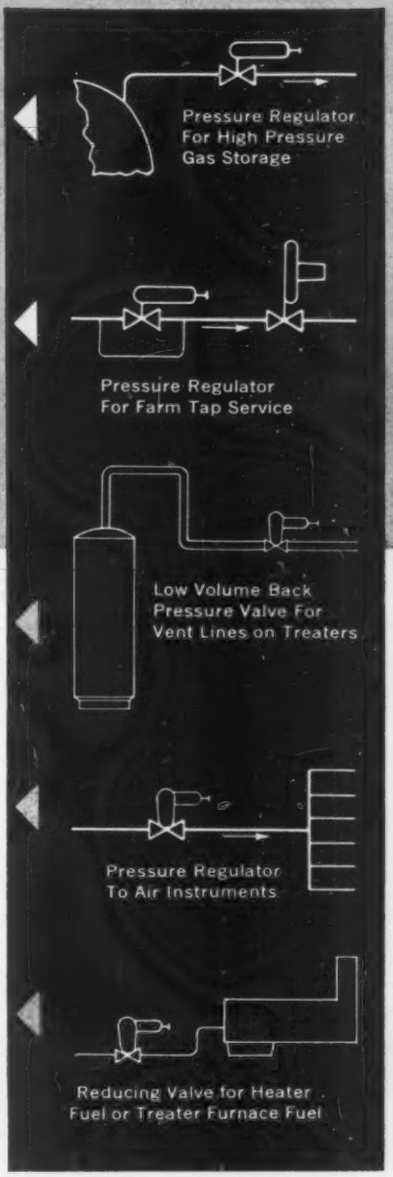
- Built for rugged, high pressure jobs
- Designed for dollar saving installations

TYPE **630** FOR INLET PRESSURES UP TO **1500** psi



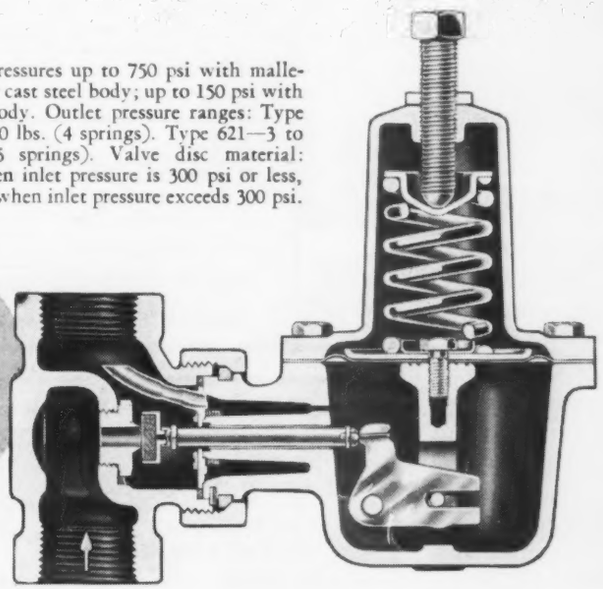
BIG JOE Type 630. Reduces high pressure gas to a constant supply pressure of 5 to 200 psi. Valve disc material: Up to 200 psi inlet BunaN is furnished. 200 psi inlet and above, Nylon is furnished. (Teflon is available when specified.)

Big Joe is supplied in 1″ or 2″ screwed connections. Type 630 can also be furnished as a relief valve, Type 630R for relief pressures up to 175 psi.


Pressure Regulator For High Pressure Gas Storage
Pressure Regulator For Farm Tap Service
Low Volume Back Pressure Valve For Vent Lines on Treaters
Pressure Regulator To Air Instruments
Reducing Valve for Heater Fuel or Treater Furnace Fuel

For inlet pressures up to 750 psi with malleable iron or cast steel body; up to 150 psi with cast iron body. Outlet pressure ranges: Type 620—3 to 60 lbs. (4 springs). Type 621—3 to 100 lbs. (5 springs). Valve disc material: BunaN when inlet pressure is 300 psi or less, and Nylon when inlet pressure exceeds 300 psi.

TYPE **620** FOR INLET PRESSURES UP TO **750** psi



IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD...CHANCES ARE IT'S CONTROLLED BY...

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Main Office and Plant: MARSHALLTOWN, IOWA

FISHER® Controls

SINCE 1880

Gas-fired infra-red burner performance curves . . . and data on application, selection, and specification of units . . . are included in new 4-page data sheet from Bryant Industrial Products Corp. Unit was designed for low-temperature industrial processing applications, such as drying metals, curing shell molds, and foundry cores, drying moist fabrics, and paint and enamel baking. Face temperature of burner screen may be regulated up to 1800 F; nominal heat input is 30,000 Btu/hr per unit. Units feature built-in flame adjustment — first adjustable infra-red burner ever made.

CIRCLE (9) ON THE REPLY CARD

Automated heat processing equipment . . including machines for heat treating, selective hardening, brazing and soldering, annealing, and other processes for heating metals . . . is described in new 16-page bulletin from Selas Corporation of America. Cost cutting features of the machines are outlined, and typical applications illustrated.

CIRCLE (10) ON THE REPLY CARD

* * *

There once was a man who called a spade a spade — until he stumbled over one in the dark.— *C. V. News.*

New form of anode . . . and literature on its use for cathodic protection systems using impressed current . . . is now available from Electro Rust-Proofing Corp. Called "PTC-Clad," the new anode is a composite conductor that combines high-current-carrying capacity of copper, anodic-passive properties of tantalum, and the non-sacrificial qualities of platinum. Its wire form and unique combination of electro-chemical properties make it possible to use platinum heretofore considered economically or technically impractical.

CIRCLE (11) ON THE REPLY CARD

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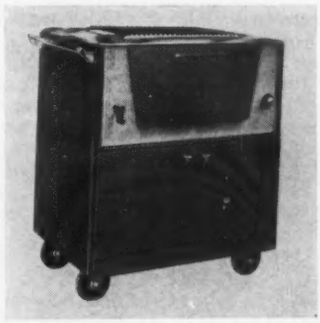
PRODUCT PARADE

Gas survey recorder . . . that dramatically cuts load research costs . . . is subject of a new 4-page catalog from Fischer & Porter Co. Catalog reviews basis for scientific gas demand studies, describes how survey costs can be minimized. Installation of gas survey unit and direct transfer of its punched tape data to a computer for study — thereby avoiding inevitable errors of manual handling — is described fully.

CIRCLE (12) ON THE REPLY CARD



Mobile built-in barbecue. Described as both a "built-in" and a "roll-out," Majestic Company's new mobile unit—the Porta-Kart — accommodates the gas-fired Char-Grill model introduced earlier this year. The Porta-Kart and Char-Grill form integral "built-in" that fits in permanent indoor location; when needed for a "cook-out" the mobile unit rolls out to the porch, yard, or patio. Overall dimensions are 36 inches in height, 33 in. width, and 22 in. deep.

CIRCLE (13) ON THE REPLY CARD

Lubricated plug valves are described in four bulletins now available from Walworth Company. Titled, "Service Fleet" (4 pages) . . . "Rolotork" (8 pages) . . . "High Strength Cast Iron" (4 pages) . . . and "Lubricating Manual" (12 pages) . . . the four bulletins are printed in 2-colors with numerous diagrams and illustrations.

CIRCLE (14) ON THE REPLY CARD

Newly designed series of service and maintenance bodies for gas service work is so planned that with a slight rearrangement and/or removal of shelves and bins, units can be made to meet most exacting requirements of any utility . . . literally enabling utility to have custom-made body at mass-produced price. Series 25-G models are available with specially-fitted compartments for storage of either tin or cast meters. Body can be furnished in 75 or 90-in. lengths for installation on old or new truck chassis, regardless of make. Optional equipment available includes telescopic roof that furnishes full-enclosed cargo space; overhead or side-mounted pipe-carrying racks; vise bracket and pipe support; light duty pintle hook and rear bumper with safety-tread step.

CIRCLE (15) ON THE REPLY CARD

Trio of specification sheets prepared by American Meter Co. give features and specification on six Reliance products: type P pressure regulators, series RV200 and 201, and DV200 and 201 valves; and type PLV pressure limited valve. Type P regulator employs single valve for pressure reductions as high as 1000 lb with minimum chance of freezing; maximum inlet pressure is 1200 psi, maximum outlet pressure is 70 psi. Series RV200 and DV200 valves with maximum relief setting of 225 psi are used for relief, back pressure, and differential applications Breakable-disc type pressure limiting valve, type PLV, is used as a safety device on take-offs; its maximum shut-off pressure is 150 psi.

CIRCLE (16) ON THE REPLY CARD

New Parsons-Shawnee 1500 backhoe features 15-ft maximum digging depth with 24, 30, or 36-in. wide buckets. Retains all features of previous models, incorporates new ones such as fully enclosed bucket cylinders, micro-honed cylinder cases, high carbon steel ground and polished cylinder rods.

CIRCLE (17) ON THE REPLY CARD

Line Stopper Tool . . . for use in pressures to 60 psi . . . is described in new spec sheet from Overton Sales Equipment Co. Designed to salvage expensive pressure control fittings, new tool can be used to seal off the line in front of a pressure control fitting so that the fitting can be removed before blanking off the line. On tie-ins, a clamp-on mechanical plug fitting is used with the line stopper. This fitting can be removed and re-used several times. This eliminates cost of welded mechanical plug as well as the possibility of a future leak, also creates smoother surface on which to apply protective coatings.

CIRCLE (18) ON THE REPLY CARD

* * *

One thing about baldness — it's neat.
— *Live Lines.*

STRAIGHT LINE PAN MOVEMENT

There's no chance for a diaphragm pan to start traveling in an arc when you install this improved Lancaster Carrier Wire Assembly.

SIDE CARRIER BRACKET **height can be quickly adjusted for most accurate positioning. No wire bending.**

OVAL SLOT CENTER BRACKET **permits diaphragm pan to travel straight through. No chance for wear.**

Oval slot center brackets available separately can be adapted to any carrier wire. Porous bronze and graphite bushings used throughout. Order now for easier installation and increased meter accuracy.

A meter is only as accurate as its parts . . . and Lancaster quality parts are guaranteed to outperform the original parts.

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American Welded Steelcase Meters provide a new approach to the economics of meter maintenance and retirement. Major repairs are eliminated. Minor adjustments are easy to make – assuring long service life at lowest maintenance costs.

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W-210	Rated cap. 210cfh — FOB Philadelphia
W-250	Rated cap. 250cfh — FOB Philadelphia
W-300	Rated cap. 300cfh — FOB Philadelphia
W-45-LPG	Rated cap. 45cfh* — FOB Philadelphia
WC-45-LPG	Rated cap. 45cfh* — FOB Philadelphia

*propane

Rated capacities at ½-inch w.c. differential with 0.64 sp. gr. gas—5 psi working pressure.

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PRODUCT PARADE

Control Valve Catalog . . . from OPW-Jordan Corp. . . . contains complete engineering information on sliding gate and plate control valves in the ¼ to 6-in. sizes. Applications, operating features and characteristics, materials of construction, pressure and temperature limitations, flow curve, sizing charts, and sample specifications are included in the 8-page catalog.

CIRCLE (19) ON THE REPLY CARD

New type of map . . . of special interest to utilities . . . pinpoints relative neighborhood buying power within recognized metropolitan areas throughout the U. S. Fifty metropolitan areas with 47% of nation's households and an estimated 53% of country's total net effective buying power are expected to be completed within next 6 mos. Maps of 16 such areas are now available. Maps have been de-

CIRCLE (20) ON THE REPLY CARD

Electron Beam Welding unit . . . three basic elements — electron-optics system, power supplies, and vacuum system — and welding characteristics . . . which are described in detail complete with graphs and illustrations in free reprint of article by W. J. Greene, R. R. Banks, and R. M. Niedzielski presented before the American Welding Society last year. Although beam welding is a tool still in the realm of future applications for gas distribution, the reprint merits reading now and you may want to tab it as a development to watch.

CIRCLE (21) ON THE REPLY CARD

Reliance type AZ Zero Governor . . . designed for maximum sensitivity at extremely low pressures . . . is described in detail in new bulletin from American Meter Co. Governor is recommended for gas engine installations, pre-mix machines, and other gas-air applications where zero pressure or vacuum opening is required.

CIRCLE (22) ON THE REPLY CARD

EMPLOYMENT WANTED

Experienced manager seeks employment with gas distribution company. Six years' experience in construction, maintenance, and business end; also two years' experience in water systems. Box 6830, American Gas Journal, P. O. Box 1589, Dallas 21, Texas.

GAS DISTRIBUTION ENGINEERS

Engineers experienced in all phases of the engineering and installation of gas distribution systems for cities and towns, including feasibility studies, design, preparation of specifications, field location, and supervision of construction, inspection, testing, conversion and start-ups. Openings for Project Manager and Project Engineers. Salary commensurate with experience. Send summary of experience and education. Box 6840, American Gas Journal, P. O. Box 1589, Dallas 21, Texas.

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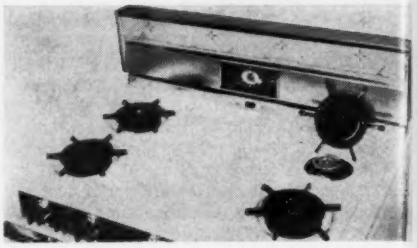
in your territory. From your desk you can earn a substantial addition to your income. Only written contracts with your clients! Write for particulars and further details to VKK-Office, Vienna 66, P. O. B. 128, Austria.



New spill-proof gas range grate or utensil support for gas ranges has been developed by Hardwick Stove Co. in conjunction with Brooklyn Union Gas Co. Made of cast iron, the new grate has a solid center section that completely covers and protects top of the burner so flame can not be snuffed out. Will be of particular value in states and cities carrying old age, infirmed, and elderly statutory regulations as to burners and burner ignition; also it will meet requirements of range safety during long periods of unattended cooking usage. New grate has also been engineered to accommodate thermostatic-controlled top burner sensing elements.

CIRCLE (23) ON THE REPLY CARD

Selection of the right commercial water heater to supply enough sanitizing rinse water for each classification of dishwashing machines has been simplified by use of an equipment selection chart being distributed by Ruud Manufacturing Co. Developed cooperatively with National Sanitation Foundation, the new chart relates operating requirements of commercial dishwashers to all kinds of water heating equipment.

CIRCLE (24) ON THE REPLY CARD

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Used since 1897
Improved Locking Sleeve

PIPE STOPPERS OF ALL KINDS

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